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IN THE SUPREME COURT OF THE UNITED STATES

OCTOBER TERM, 1995

JAMES GOMEZ, Director, California Department of Corrections; and
ARTHUR CALDERON, Warden, *Petitioners*,

v.

DAVID FIERRO and ALEJANDRO GILBERT RUIZ, *Respondents*.

ON PETITION FOR WRIT OF CERTIORARI TO THE
UNITED STATES COURT OF APPEALS FOR THE NINTH CIRCUIT

PETITION FOR WRIT OF CERTIORARI

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QUESTION PRESENTED

Does a state's method of execution by lethal gas violate the Eighth Amendment because there is a risk that condemned inmates may not be rendered immediately unconscious and may experience some pain?

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IN THE SUPREME COURT OF THE UNITED STATES**OCTOBER TERM, 1995****No. 95 -**

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v.

DAVID FIERRO and **ALEJANDRO GILBERT RUIZ**, *Respondents*.

OPINIONS BELOW

The opinion of the United States Court of Appeals for the Ninth Circuit affirming the district court is reported at 77 F.3d 301 (1996). A copy of the opinion is attached to this petition as Appendix A. The order of the district court granting declaratory and injunctive relief is reported at 865 F.Supp. 1387 (N.D. Cal. 1994). A copy of the opinion is attached as Appendix B.

STATEMENT OF JURISDICTION

The order of the United States Court of Appeals for the Ninth Circuit was filed on February 21, 1996. Appendix A. This petition for writ of certiorari is filed within 90 days of that date. 28 U.S.C. § 2101(c); Supreme Court Rules 13.1, 13.3. This Court's jurisdiction is invoked under 28 U.S.C. § 1254(1).

CONSTITUTIONAL PROVISION AND STATUTE INVOLVED

The Eighth Amendment of the United States Constitution provides:

Excessive bail shall not be required, nor excessive fines imposed, nor cruel and unusual punishments inflicted.

California Penal Code § 3604 provides, in pertinent part:

(a) The punishment of death shall be inflicted by the administration of a lethal gas

STATEMENT OF THE CASE

Respondents, two California death row inmates, filed a complaint alleging violation of their federal civil rights on April 17, 1992. They sought: (1) a declaration on behalf of themselves and all other California condemned prisoners that former California Penal Code § 3604^{1/2} was unconstitutional to the extent that it authorized execution by means of lethal gas; (2) a preliminary and permanent injunction against the use of lethal gas as a method of execution; and (3) monetary

1. At the time the complaint was filed, § 3604 provided for lethal gas as the only method of execution. The statute was subsequently amended to permit condemned inmates to choose lethal gas or lethal injection as the method of execution. An inmate's failure to select a method results in execution by lethal gas.

damages. In addition, the complaint sought a temporary restraining order (TRO) to prevent petitioners from executing a third named plaintiff, Robert Alton Harris, as scheduled on April 21, 1992.

On April 18, 1992, the district court granted a TRO and enjoined the state from executing Harris in the gas chamber. *Fierro v. Gomez*, 790 F.Supp. 966 (N.D. Cal. 1992) [*Fierro I*]. The Court of Appeals granted petitioners' petition for writ of mandamus and vacated the TRO on April 19, 1992. *Gomez v. District Court*, 966 F.2d 460 (9th Cir. 1992). This Court subsequently vacated three stays of Harris's execution based on the proceedings in this case, *Gomez v. District Court*, 503 U.S. 653 (1992); *Vasquez v. Harris*, 503 U.S. 1000 (1992), and Harris was executed on April 21, 1992.

Pursuant to the district court's order petitioners filed their answer to the complaint on May 14, 1992. On September 17, 1992, the district court vacated a hearing on respondents' motion for class certification and stayed further proceedings in the case pending the outcome of efforts in the California Legislature to amend § 3604. Petitioners agreed in August 1993 that any relief granted the named plaintiffs would also apply to all death row inmates; based on that assurance the district court did not rule on the motion for class certification. The court ordered a trial on respondents' claims for declaratory and injunctive relief.

A seven-day trial was conducted between October 25 and November 5, 1993. On October 4, 1994, the district court issued its order declaring § 3604 unconstitutional to the extent that it authorized execution by lethal gas and enjoining petitioners from using lethal gas to execute respondents. *Fierro v. Gomez*, 865 F.Supp. 1387 (N.D. Cal. 1994) [*Fierro II*].

On appeal, the Ninth Circuit found that the district court's factual findings regarding pain were

sufficient to support its declaration that lethal gas is an unconstitutional method of execution. *Fierro v. Gomez*, 77 F.3d 301, 308 (9th Cir. 1996) [*Fierro III*]. The Court of Appeals found a "substantial risk" that condemned inmates would suffer "horrible pain . . . for several minutes." *Id.* On that basis it affirmed the permanent injunction against the use of lethal gas as a method of execution.

REASONS FOR GRANTING THE PETITION

The district court's decision that execution by means of lethal gas violates the Eighth Amendment prohibition against cruel and unusual punishment is unprecedented. Prior to the issuance of *Fierro II*, no state or federal court had ever sustained a general challenge to a method of execution. Since then the circuit courts have issued conflicting decisions. While the Ninth Circuit affirmed the district court in the case now before this Court, *Fierro III*, the Fourth Circuit expressly refused to follow the district court's analysis. *Hunt v. Nuth*, 57 F.3d 1327, 1337-1339 (4th Cir. 1995), *cert. denied* 116 S.Ct. 724 (1996). This split in the circuits leaves unclear the jurisprudence surrounding the manner of enforcing society's most extreme penalty. The states deserve a uniform rule on this important issue of public policy.

The Eighth Amendment prohibits infliction of "cruel and unusual punishments," a Clause that has long been "interpreted in a flexible and dynamic manner." *Gregg v. Georgia*, 428 U.S. 153, 171 (1976) (joint opinion of Stewart, Powell & Stevens, JJ.). The "settled rule" for Eighth Amendment violations precludes "the unnecessary and wanton infliction of pain" *Hudson v. McMillian*, 503 U.S. 1, 5 (1992). The showing

necessary to satisfy this rule "varies according to the nature of the alleged constitutional violation." *Id.*

This Court's earliest cases on the Cruel and Unusual Punishments Clause examined whether particular methods of execution "were too cruel to pass constitutional muster." *Gregg v. Georgia*, 428 U.S. at 170 (joint opinion). Thus, the Court has approved the use of a firing squad, *Wilkerson v. Utah*, 99 U.S. 130 (1878) and electrocution, *In re Kemmler*, 136 U.S. 436 (1890); *see also Louisiana ex rel. Francis v. Resweber*, 329 U.S. 459 (1947) (second attempt at execution after electric chair failed to operate did not violate Eighth Amendment). Although this Court has not specifically considered whether lethal gas, the execution method at issue in this case, violates the Constitution, it has explained that the Eighth Amendment "forbids the infliction of unnecessary pain in the execution of the death sentence." *Francis v. Resweber*, 329 U.S. at 463. "Punishments are cruel when they involve torture or a lingering death," *In re Kemmler*, 136 U.S. at 447; "unnecessary cruelty," *Wilkerson v. Utah*, 99 U.S. at 136; or "something inhuman and barbarous, torture and the like." *Weems v. United States*, 217 U.S. 349, 368 (1910).

The Court has explained that an Eighth Amendment violation must be premised upon "an unreasonable risk of serious damage" to the prisoner. *Helling v. McKinney*, 509 U.S. ___, 113 S.Ct. 2475, 2481 (1993). In order to obtain an injunction based on the Eighth Amendment the prisoner must show "an objectively intolerable risk of harm." *Farmer v. Brennan*, 511 U.S. ___, 114 S.Ct. 1970, 1983 (1994). Allegations of injury or threat of future injury must be real and immediate, rather than conjectural or hypothetical. *Los Angeles v. Lyons*, 461 U.S. 95, 101-102 (1983). Where a claim of future injury is "speculative," a "prerequisite of equitable relief has not been found." *Id.* at 111. The

Ninth Circuit's decision is inconsistent with this Court's Eighth Amendment jurisprudence.

After reviewing the expert testimony and scientific literature introduced at trial, the district court found that such information "cannot answer the key question in this action: which effects [of cyanide] are felt first, and whether unconsciousness sets in quickly under the conditions present in the San Quentin gas chamber." *Fierro II*, 865 F.Supp. at 1399. The court then examined eyewitness descriptions of gas chamber executions, which it found "probative although to varying degrees." *Fierro II* at 1400.

Based largely on the eyewitness declarations and San Quentin records, the district court concluded that "inmates executed in the gas chamber at San Quentin are not rendered immediately unconscious" *Fierro II* at 1403. While conscious, the court added, "the condemned inmate is *likely* to suffer intense physical pain." *Id.* at 1413 (emphasis added). The district court concluded, however, that the "objective evidence" failed to "rise to the extreme level" so as to support a finding from this evidence alone that execution in the gas chamber is unconstitutional. *Id.* at 1414. Rather, the district court observed that respondents' evidence at best "*strongly suggests* that the pain experienced by those executed is unconstitutionally cruel and unusual." *Id.* at 1415 (emphasis added). Only by taking the additional step of considering the trend away from lethal gas in other states did the district court conclude that the gas chamber is unconstitutional. *Id.* at 1415.

The Ninth Circuit found it unnecessary to engage in an analysis of legislative trends because it found that the district court's "factual findings regarding pain" were alone sufficient to establish a "substantial risk" that the condemned prisoner would suffer "horrible pain" during an execution by lethal gas. *Fierro III* at 308. The

Ninth Circuit made no independent fact findings, but rested its decision entirely on its acceptance of the factual determinations made by the district court. *Id.* The risk identified by the district court, however, was that *consciousness* might persist. *Fierro II* at 1413. The district court could conclude only that the evidence "strongly suggest[ed]" the unnecessary infliction of pain. *Id.* at 1415.

A risk, even if substantial, that a method of execution does not render the prisoner immediately unconscious does not rise to the unnecessary and wanton infliction of pain which is essential to establishing an Eighth Amendment violation. This is particularly so where the finding of consciousness is based, as it was in this case, on inferences from subjective descriptions of eyewitnesses to executions. *See Fierro II* at 1400. As another district court observed in refusing to credit some of the declarations relied upon by the lower courts in this case, such descriptions are "full of prose calculated to invoke sympathy, but insufficient to demonstrate that execution by the administration of gas involves the *wanton* and unnecessary infliction of pain." *Hunt v. Smith*, 856 F.Supp. 251, 260 (D.Md. 1994) (emphasis in original); *see also* Freinkel et al., *Dissociative Symptoms in Media Eyewitnesses of an Execution*, 151 A. J. Psychiatry 1335 (1994). The Ninth Circuit previously recognized this distinction when it upheld the constitutionality of executions by hanging, noting a condemned prisoner is "not entitled to a painless execution, but only to one free of *purposeful cruelty*." *Campbell v. Wood*, 18 F.3d at 687 (emphasis added).

In *Hudson v. McMillian*, 503 U.S. at 8, this Court explained that the requirements applicable to an Eighth Amendment claim "depend[] upon the claim at issue" While the Court has, in recent terms, examined a number of Eighth Amendment issues, it has

not expressly considered any challenge to a method of execution since it decided *Francis v. Resweber* in 1947. Many other courts, state and federal, have examined execution methods. Apart from the decisions of the Ninth Circuit and district court in this case, no court has ever sustained a general challenge to a method of execution.² Indeed, the one federal court to examine the use of lethal gas since the district court decision in this case expressly refused to follow *Fierro II*, even though many of the declarations considered by the district court in this case were also proffered in that case. "Lethal gas currently may not be the most humane method of execution — assuming that there could be a humane method of execution — but the existence and adoption of more humane methods does not automatically render a contested method cruel and unusual." *Hunt v. Nuth*, 57 F.3d at 1337-1338, *aff'ing* *Hunt v. Smith*, 856 F.Supp. 251.

The decision by the Ninth Circuit conflicts with numerous decisions of other state and federal courts which have upheld the use of lethal gas as a method of execution. See, e.g., *Hunt v. Nuth*, 57 F.3d at 1337-1338; *Gray v. Lucas*, 710 F.2d 1048, 1061 (5th Cir. 1983); *People v. Daugherty*, 40 Cal.2d 876, 894-896, 256 P.2d 911 (1953); *State v. Greenway*, 170 Ariz. 155, 823 P.2d 22, 27 (1991); *Calhoun v. State*, 297 Md. 348, 468 A.2d 45, 68-70 (1983); *Billiot v. State*, 454 So.2d 445, 464 (Miss.

1984); *Duissen v. State*, 441 S.W.2d 688, 693 (Mo. 1969). More importantly, the showing necessary to sustain an Eighth Amendment challenge to a method of execution is an important question of federal law that should be settled by this Court. Accordingly, we urge the Court to grant certiorari to decide whether a method of execution in general, and the use of lethal gas in particular, may be judicially outlawed because it carries a risk of pain and does not guarantee immediate unconsciousness.

2. In *Rupe v. Wood*, 863 F.Supp. 1307 (W.D. Wash. 1994), the district court recognized in light of *Campbell* that hanging is generally constitutional but found that the risk of decapitation or slow strangulation rendered such an execution unconstitutional as applied to the 409 pound prisoner in that case. The *Rupe* decision is presently on appeal.

CONCLUSION

For the reasons stated above, petitioners respectfully request that this Court grant the petition for writ of certiorari to the United States Court of Appeals for the Ninth Circuit.

Dated: May 6, 1996.

Respectfully submitted,

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APPENDIX A

Filed February 21, 1996
Cathy A. Catterson
United States Court of Appeals

UNITED STATES COURT OF APPEALS

FOR THE NINTH CIRCUIT

DAVID FIERRO; ALEJANDRO
GILBERT RUIZ; and
ALEJANDRO GILBERT RUIZ,
as individuals and on
behalf of themselves
and all others
similarly situated,

No. 94-16775

D. C. No. CV-92-1482 MHP

OPINION

Plaintiffs-Appellees,

vs.

JAMES GOMEZ, as an
individual, and in his
capacity as Director,
California Department
of Corrections, and
ARTHUR CALDERON, as
an individual, and in
his capacity as Warden of
San Quentin Prison,

Defendants-Appellants./

Appeal from the United States District Court
for the Northern District of California
Marilyn H. Patel, District Judge, Presiding

Argued and Submitted: December 5, 1995
San Francisco, California

Filed February 21, 1996

Opinion by Judge Peterson

Before: PREGERSON, BRUNETTI, and T.G. NELSON, Circuit Judges.

PREGERSON, Circuit Judge:

Plaintiffs, three California inmates sentenced to death, brought this action under 42 U.S.C. § 1983. The inmates alleged that California's method of execution, lethal gas, constitutes cruel and unusual punishment and thus violates the Eighth and Fourteenth Amendments of the federal Constitution. The United States District Court for the Northern District of California held that, to the extent that the statute provides for execution by lethal gas, it is cruel and unusual punishment. Defendants James Gomez, Director of the California Department of Corrections, and Arthur Calderon, Warden of San Quentin Prison, now appeal that decision. Defendants also appeal the district court's permanent injunction against the use of lethal gas as a method of execution. We have jurisdiction under 28 U.S.C. § 1291. We affirm.

PRIOR PROCEEDINGS

On April 17, 1992, plaintiffs David Fierro, Alejandro Gilbert Ruiz, and Robert Alton Harris, California inmates sentenced to death, filed this suit on behalf of themselves and all others similarly situated. Fierro v. Gomez, 790 F. Supp. 966 (N.D. Cal. 1992) ("Fierro I"). Harris was scheduled to be executed in California's gas chamber on April 21, 1992, four days later. The inmates sought relief under 42 U.S.C. § 1983, alleging that California's method of execution statute, Cal. Penal Code § 3604, violates the Eighth and Fourteenth Amendments to the United States Constitution. Defendants opposed the suit, alleging that the district court did not have jurisdiction under §

1983. Defendants argued that a challenge to the method by which an inmate will be executed must be brought as a petition for writ of habeas corpus rather than as a § 1983 civil rights action. Fierro I, 790 F. Supp. at 968. The district court held that it had jurisdiction under § 1983 because plaintiffs were not challenging the fact or duration of their sentences and were therefore not required to bring their claims as habeas petitions. Id.

The district court granted plaintiffs' motion for a temporary restraining order ("TRO") enjoining defendants from executing any California death row inmate by means of lethal gas. Fierro I, 790 F. Supp. at 7. The court found that there existed serious questions going to the merits and that an evidentiary hearing was necessary. Id. at 970-71.

Defendants appealed to this court and we vacated the district court's TRO. Gomez v. Unites States Dist. Court, No. 92-70237, 1992 U.S. App. LEXIS 7031 (9th Cir. Apr. 20, 1992), vacated as moot and withdrawn, 966 F.2d 463 (9th Cir. May 5, 1992). At least three stays ere subsequently entered by this court and then vacated by the U.S. Supreme Court. See Gomez v. Vasquez, No. 92-55426 (9th Cir. Apr. 20, 1992), vacated by Vasquez v. Harris, 503 U.S. 1000 (1992) (No. A-766); Vasquez v. Harris, No. 92-70237 (9th Cir., Apr. 21, 1992), Vacated by Vasquez v. Harris, 503 U.S. 1000 (1992) (No. A-768).

Harris also filed a petition for writ of habeas corpus with the California Supreme Court on April 21, 1992. This petition challenged the constitutionality of execution by lethal as under both the federal and California constitutions. The California Supreme Court, in an unpublished decision with one justice dissenting, denied the case "on the merits." In re Robert Alton Harris, No. S026235 (Cal. Sup. Ct. 1992) (in bank). The court offered no new analysis for its conclusion, merely citing to its own previous decisions

and those of other courts finding execution by lethal gas to be constitutional.¹⁷ Id. at 1. The court also emphasized the "last minute" nature of Harris's claim, id. at 1-2, as did the U.S. supreme Court, Gomez v. United States Dist. Court, 503 U.S. at 654.

Harris was executed in San Quentin's gas chamber shortly after 6:00 a.m. on April 21, 1992. Plaintiffs Fierro and Ruiz remain on California's death row.

When California executed Harris, the state's sole method of execution was the "administration of a lethal gas." Cal. penal Code § 3604 (West 1982). Soon after Harris's execution, in response to this case, the California legislature amended section 3604 by adding lethal injection as an alternative means of execution. Cal. Stats. 1992, c.558. The amended statute provides for execution by lethal gas unless an inmate affirmatively chooses lethal injection and "if either manner of execution . . . is held invalid, the punishment of death shall be imposed by the alternative means." Cal. Penal Code § 3704 (West Supp. 1995).

1. Justice Stanley Mosk dissented because he found that an evidentiary hearing was justified. Harris, No. S026235, at 3-4. Justice Mosk noted that the California Supreme Court had last analyzed execution by lethal gas in 1953 and that, at the time, the court had implied that it was "controlled by our scientific knowledge of the subject." Id. at 3 (quoting People v. Daugherty, 40 Cal. 2d 876, 895, 256 P.2d 911, 922 (1953), cert. denied, 346 U.S. 827 (1953)). Justice Mosk pointed out that the court's "'knowledge,' however, apparently consisted of the 'fact' that '[f]or many years animals have been put to death painlessly by the administration of poisonous gas.'" Id. (quoting Daugherty, 40 Cal. 2d at 895, 256 P.2d at 922).

In October and November 1993, the district court held an eight-day bench trial on the original § 1983 action. Fierro v. Gomez, 865 F. Supp. 1387, 1389 (N.D. Cal. 1994) ("Fierro II"). Soon after the trial but before the district court issued its decision, an en banc panel of this court held constitutional the State of Washington's protocol for execution by hanging. Campbell v. Wood, 18 F.3d 662 (9th Cir. 1994) (en banc), cert. denied, 114 S.Ct. 2125 (1994). The district court then ordered the Fierro parties to file supplementary briefs addressing the impact of Campbell on the Fierro case. The district court published its decision in October 1994. Fierro II, 865 F. Supp. 1387.

In Fierro II, the district court found that "California Penal Code § 3604, to the extent that it requires or permits the imposition of death by administration of lethal gas, violates the eighth and fourteenth amendments of the United States Constitution." 865 F. Supp. at 1415. The court enjoined defendants from using lethal gas to execute either of the two remaining plaintiffs or any other California death row inmate Id.

ANALYSIS

A. Section 1983.

1. Standard of Review.

The district court's conclusions of law are reviewed de novo. Price v. United States Navy, 39 F.3d 1011, 1021 (9th Cir. 1994). We thus review de novo whether the district court was correct in concluding that a challenge to a method of execution may be brought as a § 1983 civil rights action.

2. Discussion.

Section 1983 provides the statutory authorization for most federal court suits against local governments or state and local government officials to redress violations of federal civil rights. To bring a § 1983 action, a plaintiff must allege (1) a violation of a right secured by the Constitution or federal law, and (2) that this right was violated by someone acting under color of state law. 42 U.S.C. § 1983; Fierro I, 790 F. Supp. at 967. Challenges to prison conditions ("conditions of confinement") are often brought as § 1983 actions. See, e.g., Rhodes v. Chapman, 452 U.S. 337, 340 (1981) (allowing Eighth Amendment challenge to a prison's practice of "double celling" to be brought under § 1983); Hutto v. Finney, 437 U.S. 678, 685 (1978) (allowing Eighth Amendment challenge to conditions of confinement to be brought under § 1983).

In contrast, an inmate must challenge the constitutionality of his conviction or sentence by means of a petition for writ of habeas corpus. Preiser v. Rodriguez, 411 U.S. 475, 489-90 (1973). The habeas statute provides that:

The Supreme Court, a Justice thereof, a circuit judge, or a district court shall entertain an application for a writ of habeas corpus in behalf of a person in custody pursuant to the judgment of a State court only on the grounds that he is in custody in violation of the constitution or laws or treaties of the United States.

28 U.S.C. § 2254. Habeas corpus's "traditional purpose" is to allow an inmate seeking "immediate or more speedy release" to challenge his confinement. Preiser, 411 U.S. at 494.

Here, district court found that plaintiffs Fierro, Ruiz, and Harris could properly bring their claims

under § 1983.² Fierro I, 790 F. Supp. at 967. The court reasoned that plaintiffs sought "review of the method by which their sentence will be carried out" rather than review of the fact that they were sentenced to death. In addition, the court held that:

Since plaintiffs' claim does not, and could not, challenge the fact or duration of sentence, it need not be brought as a habeas claim. To hold otherwise would carve out of habeas and § 1983 law a separate jurisprudence for death penalty cases. There is no authority for such a dichotomy.

Id. at 968.

The court noted that several methods of execution challenges have been brought under § 1983. Fierro I, 790 F. Supp. at 969. In one of these cases, the Eleventh Circuit specifically found § 1983 appropriate for a method of execution challenge. Sullivan v. Dugger, 721 F.2d 719, 720 (11th Cir. 1983) (holding that § 1983 is appropriate when an inmate challenges the method by which he is to be executed rather than "the fact or nature of his sentence or the state's right to execute him").

Defendants contend that the district court erred in allowing plaintiffs to bring a challenge to the

2. The court also correctly noted that "[t]he Supreme Court has declined to address whether conditions of confinement claims may be brought under habeas." Fierro I, 790 F. Supp. at 967 n.2 (citing Bell v. Wolfish, 441 U.S. 520, 526 n.6 (1979)). In the present case, we also decline to address whether a challenge to a condition of confinement or method of execution may be brought under habeas as this issue is not before us.

constitutionality of execution by lethal gas as a § 1983 claim. Defendants argue that § 1983 and habeas are mutually exclusive remedies and that a habeas petition is the sole means by which a death row inmate may challenge the method by which he is to be executed. Defendants rely on Preiser, 411 U.S. 475, to support their argument that habeas and § 1983 are mutually exclusive. Preiser, however, noted only that habeas was the exclusive remedy when an inmate challenged "the very fact or duration of his physical imprisonment." 411 U.S. at 500. See also Heck v. Humphrey, ___ U.S. ___, 114 S.Ct. 2364, 2369 (1994) (stating that Preiser held that "habeas corpus is the exclusive remedy for a state prisoner who challenges the fact or duration of his confinement and seeks immediate or speedier release, even though such a claim may come within the literal terms of § 1983").

Defendants also cite method of execution challenges brought as habeas petitions to support their argument that habeas is the sole means by which an inmate may challenge the method by which he is to be executed. In particular, defendants rely on this court's recent en banc decision in which the majority opinion held that Washington's protocol for execution by hanging did not constitute cruel and unusual punishment. Campbell v. Wood, 18 F.3d 662 (9th Cir. 1994), cert. denied, 114 S.Ct. 2125 (1994).

No court, however, has held that method of execution challenges must be brought as habeas petitions rather than § 1983 actions. In fact, a federal court may construe a § 1983 action as a habeas petition, Franklin v. Oregon, 662 F.2d 1337, 1347 & n.13 (9th Cir. 1981), or a habeas petition as a § 1983 action, Wilwording v. Swenson, 404 U.S. 249, 251 (1971) (per curiam).³ In addition, as defendants

3. This helps explain why some method of

acknowledge, at least two circuits have allowed method of execution challenges to be brought as § 1983 claims. See Ingram v. Ault, 50 F.3d 898, 899 (11th Cir. 1995); O'Bryan v. McKaskle, 729 F.2d 991, 992-93 & n.1 (5th Cir. 1984); Sullivan v. Dugger, 721 F.2d 719, 720 (11th Cir. 1983).

Defendants cite no authority for their claim that allowing plaintiffs to pursue their method of execution challenge would result in reductions in their sentences. Indeed, the current California method of execution statute provides that, if lethal gas "is held invalid, the punishment of death shall be imposed by the alternative means," lethal injection. Cal. Penal Code § 3604 (West Supp. 1995). Thus, regardless of whether we conclude that the district court was correct in finding execution by lethal gas unconstitutional, plaintiff's sentences of death remain unaffected.

execution challenges have been brought as habeas petitions and others as § 1983 actions. The courts may have construed habeas petitions as § 1983 actions and vice versa, without noting this fact. See e.g., Graham v. Broglin, 922 F.2d 379, 381-82 (7th Cir. 1991) ("If a prisoner who should have asked for habeas corpus misconceives his remedy, brings a civil rights suit, and fails to exhaust his state remedies, his suit must be dismissed. But if, as in this case, he asks for habeas corpus when he should have brought a civil rights suit, all he has done is mislabel his suit, and either he should be given leave to plead over or the mislabeling should simply be ignored."); Franklin, 662 F.2d at 1347 n.13 ("Nonetheless, we find that the trial court was justified in construing Franklin's complain as a habeas petition [rather than a § 1983 suit] because Franklin brought his complaint pro se. Courts cannot expect a pro se litigant to adhere to formalistic pleading requirements.").

Section 1983 actions, unlike habeas petitions, do not have a state exhaustion requirement. See Monroe v. Pape, 365 U.S. 167, 183 (1961) (stating that, with a § 1983 action alleging a constitutional violation, "the federal remedy is supplementary to the state remedy and the latter need not be first sought and refused before the federal one is invoked"). Defendants cite the exhaustion requirement to support their argument that plaintiffs must challenge their executions by lethal gas by habeas petition rather than as a § 1983 claim. This, however, does not affect our analysis.

There is no authority to support defendant's assertion that habeas is the exclusive means by which to challenge a method of execution. Method of execution challenges are analogous to challenges to conditions of confinement. If an inmate challenges a condition of confinement as a violation of the Eighth Amendment's prohibition on cruel and unusual punishment, he may bring that challenge as a § 1983 action. There is no authority for treating the present case any differently. As stated by the district court, "[t]o hold otherwise would carve out of habeas and § 1983 law a separate jurisprudence for death penalty cases." Fierro I, 790 F. Supp. at 968.

Our court has defined the appropriate situation in which to seek habeas relief as "whenever the requested relief requires as its predicate a determination that a sentence currently being served is invalid or unconstitutionally long. They seek only to prevent their executions by lethal gas. We therefore follow our sister circuits and hold that a challenge to a method of execution may be brought as a § 1983 action.

In sum, a challenge to the method by which an inmate sentenced to death will be executed may be brought pursuant to § 1983. The district court was correct in allowing plaintiffs to pursue their claims under § 1983.

B. Cruel and Unusual Punishment.

1. Standard of Review.

Following a bench trial, the judge's "[f]indings of fact, whether based on oral or documentary evidence, shall not be set aside unless clearly erroneous." Fed. R. Civ. P. 52(a); Saltarelli v. Bob Baker Group Medical Trust, 35 F.3d 382, 385 (9th Cir. 1994). "Review under the clearly erroneous standard is significantly deferential, requiring a definite and firm conviction that a mistake has been committed." Exxon Co. v. Sofec Inc., 54 F.3d 570, 576 (9th Cir. 1995), cert. granted, 116 S.Ct. 493 (1995) (quoting Concrete Pipe & Prods. of Cal., Inc. v. Construction Laborers Pension Trust for S. Cal., ___ U.S. ___, 113 S.Ct. 2264, 2280 (1993)). The district court's conclusions of law and the ultimate question of the constitutionality of California's method of execution statute are reviewed de novo. Destination Ventures, Ltd. v. FCC, 46 F.3d 54, 55 (9th Cir. 1995); National Ass'n of Radiation Survivors v. Derwinski, 994 F.2d 583, 587 (9th Cir. 1992), cert. denied, 114 S.Ct. 634 (1993).

2. Discussion.

The Eighth Amendment prohibits governmental imposition of "cruel and unusual punishments," U.S. Const. amend. VIII, and bars "infliction of unnecessary pain in the execution of the death sentence," Louisiana ex rel. Francis v. Resweber, 329 U.S. 459, 464 (1947) (plurality opinion). "Punishments are deemed cruel when they involve torture or a lingering death" In re Kemmler, 136 U.S. 436, 447 (1890). The meaning of "cruel and unusual" must be interpreted in a "flexible and dynamic manner," Gregg v. Georgia, 428 U.S. 153, 171 (1976) (joint opinion), and measured against "the evolving standards of decency that mark

the progress of a maturing society," Trop v. Dulles, 356 U.S. 86, 101 (1958) (plurality opinion).⁴

Although this court has never addressed whether execution by lethal gas is cruel and unusual punishment, we recently applied Eighth amendment standards to execution by hanging. Campbell v. Wood, 18 F.3d 662 (9th Cir. Feb. 8, 1994) (en banc), cert. denied, 114 S.Ct. 2125 (1994). The en banc majority opinion in Campbell held that hanging, when conducted according to Washington State's detailed protocol, did not constitute cruel and unusual punishment.⁵

4. In addition to analyzing pain, a number of Eighth Amendment decisions also examine legislative trends. Evidence of legislative trends away from a particular punishment or of the proportion of states imposing a particular punishment is relevant evidence of whether a punishment is 'cruel and unusual.' Trop v. Dulles, 356 U.S. 86, 102 (1958) (plurality opinion); Weems v. United States, 217 U.S. 349, 377 (1910). Legislative trends are particularly relevant when measuring the "evolving standard of decency." Penry v. Lynaugh, 492 U.S. 302, 331 (1989); Stanford v. Kentucky, 492 U.S. 361, 373 (1989); McCleskey v. Kemp, 481 U.S. 279, 300 (1987). See also Campbell v. Wood, 114 S.Ct. 2125 (1994) (concluding that, although the number of states using a particular method of execution, hanging, "is evidence of public perception," such evidence is not dispositive merely because few states continue using that particular method).

5. The district court relied on evidence of only one hanging, that of Westley Allan Dodd, conducted in 1993 in accordance with the protocol. According to the doctor who witnessed the execution and pronounced Dodd's death, "Dodd became unconscious within a matter of seconds." Campbell, 18 F.3d at 685. The district court

In Campbell we stated that, when analyzing a method of execution, as opposed to the proportionality of a punishment to a particular crime, judicial review "focuses more heavily on the objective evidence of the pain involved in the challenged method." 18 F.3d at 682. We concluded in Campbell that it was not necessary to analyze legislative trends because unconsciousness and death by hanging, performed in accordance with Washington's protocol, was quick and thus did not inflict an unconstitutional amount of pain. See id. at 682-83. We affirmed the district court's factual findings, summarizing them as follows:

[T]he mechanisms involved in bringing about unconsciousness and death in judicial hanging occur extremely rapidly, . . . unconsciousness was likely to be immediate or within a matter of seconds, and . . . death would follow rapidly thereafter. The . . . risk of death by decapitation was negligible, and . . . hanging according to the protocol does not involve

excluded evidence of other hangings in which the inmate had died through either asphyxiation or by decapitation because these "bungled" hangings "could not be reliably compared to" Washington's method, which was governed by a detailed protocol. Id.

Washington's protocol regulates the diameter of the rope, the elasticity of the rope, the proper knot to use, and the particular distance the inmate is dropped, depending on his body weight. The protocol, by defining and regulating these factors, sought to ensure "rapid unconsciousness and death" and to avoid "the risks of death by asphyxiation and decapitation, as opposed to death by injury to vascular, spinal, and nervous functions." Campbell, 18 F.3d at 683.

lingering death, mutilation, or the unnecessary and wanton infliction of pain.

Id. at 687.

In Fierro II, the district court correctly determined the framework under which the constitutionality of execution by lethal gas must be evaluated:

First, the key question to be answered in a challenge to a method of execution is how much pain the inmate suffers. . . . Death where unconsciousness is likely to be immediate or within a matter of seconds is apparently within constitutional limits. While the Campbell court did not pinpoint a threshold at which the time to unconsciousness and the corresponding pain would violate the Constitution, the court implied that the persistence of consciousness for over a minute or for between a minute and a minute-and-a-half, but no longer than two minutes might be outside constitutional boundaries.

Campbell also made clear that the method of execution must be considered in terms of the risk of pain. The Campbell court determined that under the Washington hanging protocol, the risk of a prolonged and agonizing death by asphyxiation or decapitation was negligible.

Fierro II, 865 F. Supp. at 1410-11 (footnotes, citations, and internal quotations omitted).

In the present case, the district court held an eight-day bench trial. Fierro II, 865 F. Supp. at 1389. The court heard testimony from several expert medical witnesses and reviewed scientific literature regarding

the effect of cyanide gas inhalation on humans and animals. Id. at 1393-1400. The court also reviewed official San Quentin prison execution records. These records were compiled by medical personnel while attending executions performed at San Quentin between 1937 and 1994. Id. at 1400-03. Other evidence considered by the court included eyewitness accounts of executions from media representatives and from friends and relatives of the executed inmates. Id. at 1401. The court found most probative the testimony of plaintiffs' experts, the responses of defendants' expert witnesses during cross-examination, and the official execution records. Id. at 1403-04. The court also noted that the execution records of Robert Harris and David Mason, executed in 1992 and 1993 respectively, were "the most probative evidence of pain and consciousness experienced" by those inmates executed in San Quentin's gas chamber "because these executions were conducted in accordance with the challenged protocol." Id. at 1401.

The execution records provided information regarding the exact time that certain events occur during the execution process. These events include the time that cyanide is released into the gas chamber, the time that the gas first strikes an inmate's face, the time that an inmate lapses into apparent unconsciousness, the time of certain unconsciousness, and the time of an inmate's last bodily movement. Fierro II, 865 F. Supp. at 1401. For example, Harris did not lapse into apparent unconsciousness until two minutes after the cyanide gas first hit his face. Harris did not appear certainly unconscious until an additional minute had passed. Similarly, Mason did not lapse into apparent unconsciousness until one minute after he began breathing the gas. Mason was not recorded as being certainly unconscious until an additional two minutes had passed. The district court also noted that "many of Mason's apparently conscious actions appeared to

be responses to pain," such as tight clenching of his fists, how his head was thrown back, and how his throat muscles strained. Id. at 1402.

The district court summarized its findings from this evidence as follows:

[I]nmates who are put to death in the gas chamber at San Quentin do not become immediately unconscious upon the first breath of lethal gas. . . . [A]n inmate probably remains conscious anywhere from 15 seconds to one minute, and . . . there is a substantial likelihood that consciousness, or a waxing and waning of consciousness, persists for several additional minutes. During this time, . . . inmates suffer intense, visceral pain, primarily as a result of lack of oxygen to the cells. The experience of "air hunger" is akin to the experience of a major heart attack, or to being held under water. Other possible effects of the cyanide gas include tetany, an exquisitely painful contraction of the muscles, and painful build-up of lactic acid and adrenaline. Cyanide-induced cellular suffocation causes anxiety, panic, terror, and pain.

Fierro II, 865 F. Supp. at 1404 (internal citations omitted).

The district court then applied these evidentiary findings to Campbell's analytic framework. The court first considered the level of pain suffered by an inmate during execution. The district court's primary findings were that: (1) "inmates are likely to be conscious for anywhere from fifteen seconds to one minute from the time that the gas strikes their face," (2) "there is a substantial risk that consciousness may persist for up to several minutes," 93) "During this period of

consciousness, the condemned inmate is likely to suffer intense physical pain," and 94) the cause of death by cyanide gas, cellular suffocation, was a "substantially similar experience to asphyxiation" and that Campbell had suggested that asphyxiation would be an impermissibly cruel method of execution. Fierro II, 865 F. Supp. at 1413.

The district court stated that the evidence did not "demonstrate conclusively" that inmates executed by lethal gas suffered for "minutes on end." Fierro II, 865 F. Supp. at 1414. yet the court also stated that the evidence did not "show that inmates suffered pain for only a matter of seconds." Id. As a result, the court concluded that "[t]his case falls somewhere in between" the two extremes. Id. The court then turned to a consideration of legislative trends to determine whether execution by lethal gas violated the Eighth Amendment. Id.

We think that there was no need for the district court to engage in an analysis of legislative trends. We believe that the district court's factual findings regarding pain are dispositive under the framework of Campbell. The court's findings regarding the type and level of pain inflicted during execution by lethal gas under California's protocol, when combined with its finding that there exists a substantial risk that this pain will last for several minutes, dictate such a result. We accept these factual findings because they are fully supported by the record and thus are not clearly erroneous. Under Campbell, such horrible pain, combined with the risk that such pain will last for several minutes, by itself is enough to violate the Eighth Amendment. Such being the case, a legislative trend analysis is unnecessary.

We recognize that two circuits have declined to conclude that execution by lethal gas is unconstitutional. Gray v. Lucas, 710 F.2d 1048 (5th Cir. 1983), cert. denied, 463 U.S. 1237 (1983); Hunt v.

Nuth, 57 F.3d 1327 (4th Cir. 1995), cert. denied, 64 U.S.L.W.3466 (U.S. Jan. 8, 1996).

In Gray, the Fifth Circuit affirmed the district court's denial of an evidentiary hearing to a death row inmate challenging execution by lethal gas. The Fifth Circuit concluded that:

[W]e are not persuaded that under the present jurisprudential standards the showing made by Gray justifies this intermediate appellate court holding that, as a matter of law or fact, the pain and terror resulting from death by cyanide gas is so different in degree or nature from that resulting from other traditional modes of execution as to implicate the eighth amendment right.

Gray, 710 F.2d at 1061. Unlike the instant case, however, neither the district nor appellate court had the benefit of extensive expert witness testimony that had been subjected to searching cross-examination. Nor, apparently, did either court have the benefit of extensive prison medical records documenting inmates' deaths by lethal gas and the lengths of time that these inmates likely remained conscious after exposure to the gas.

In Hunt, the Fourth Circuit declined to follow Fierro II. The court stated that "[l]ethal gas currently may not be the most humane method of execution--assuming that there could be a humane method of execution--but the existence and adoption of more humane methods does not automatically render a contested method cruel and unusual." Hunt, 57 F.3d at 1337-38. Here again, the district court in Hunt did not have the benefit of expert witness testimony subjected to searching cross-examination. See Hunt v. Smith, 856 F. Supp. 251, 260 (D. Md. 1994) (mentioning only petitioners' affidavits as the

evidentiary basis for its decision). Nor did the Fourth Circuit have the benefit of findings based on such testimony. In Hunt, neither the district court nor the Fourth Circuit mentioned official records that set forth in detail what occurred in the gas chamber during an execution. These were the keys pieces of evidence relied on by the district court in the instant case to invalidate execution by lethal gas.

Gray and Hunt do not alter our conclusion in this case. The district court in the instant case conducted an eight-day trial and was the first to consider extensive evidence on the pain involved in execution by lethal gas; and the first to make extensive factual findings regarding this pain.

In short, we hold that the district court's extensive factual findings concerning the level of pain suffered by an inmate during execution by lethal gas are not clearly erroneous. The district court's findings of extreme pain, the length of time this extreme pain lasts, and the substantial risk that inmates will suffer this extreme pain for several minutes require the conclusion that execution by lethal gas is cruel and unusual. Accordingly, we conclude that execution by lethal gas under the California protocol is unconstitutionally cruel and unusual and violates the Eighth and Fourteenth Amendments. The district court's permanent injunction against defendants is AFFIRMED.

COUNSEL PAGE

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APPENDIX B

Filed October 4, 1994
Richard W. Wicking, Clerk
United States District Court
Northern District of California

UNITED STATES DISTRICT COURT

NORTHERN DISTRICT OF CALIFORNIA

DAVID FIERRO, ROBERT HARRIS,
and ALEJANDRO GILBERT RUIZ,
as individuals and on behalf of
themselves and all others
similarly situated,

No. C-92-1482 MHP

OPINION

Plaintiffs,

vs.

JAMES GOMEZ, as an individual,
and in his capacity as Director,
California Department of
Corrections, and ARTHUR CALDERON,
as an individual, and in his capacity
as Warden of San Quentin Prison,

Defendants./

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Plaintiffs are inmates at San Quentin State Prison in San Quentin, California who have been sentenced to death under the laws of the State of California. They brought this action on April 17, 1992, on behalf of themselves and all others similarly situated, challenging the constitutionality of California's method of execution by lethal gas.

The court has jurisdiction under 28 U.S.C. § 1343. Venue is proper under 28 U.S.C. § 1391(b) since defendants reside in the State of California and a substantial part of the conduct giving rise to this action occurred and will occur in the Northern District of California.

Trial was held for eight days. Plaintiffs presented their case through eight witnesses: 1) the Reverend Martin Leon Harris, a witness to the execution of Robert Alton Harris, one of the named plaintiffs and Reverend Harris' cousin; 2) Dr. Kent Russell Olson, an expert in medical toxicology, emergency medicine, and the treatment of poisoning, including cyanide poisoning; 3) Mr. Donald Cabana, former warden of a state prison in Mississippi, who presided over two executions by lethal gas; 4) Warden Daniel Vasquez, Warden of San Quentin State Prison at the time of trial, who presided over two executions by lethal gas at San Quentin, including the execution of Robert Alton Harris, one of the named plaintiffs in his action; 5) Professor Franklin E. Zimring of the University of California at Berkeley Law School at Boalt Hall, an expert in criminal justice policy; 6) Dr. John Friedberg, an expert in neurology; and 7) Dr. Richard Traystman, an expert in the areas of hypoxia and its effects on the heart and the brain. The testimony of Dr. Robert Kirschner, former pathologist with the Cook County Medical Examiner's Office in Chicago, Illinois, was presented through videotape, by stipulation of the parties.

Defendants presented their case through the testimony of two witnesses: 1) Dr. Alan H. Hall, medical toxicologist and an expert on cyanide and emergency medicine; and 2) Dr. Steven I. Baskin, expert in pharmacology and toxicology.

Following the trial, counsel submitted post-hearing briefs, and oral argument was heard. Counsel also filed supplementary briefs addressing the impact on this action of the recent Ninth Circuit decision in Cambell v. Wood, 18 F.3d 662 (9th Cir.) (en banc), reh'g and reh'g en banc denied, 20 F.3d 1050 (1994).

Having considered the testimony and evidence presented at trial, the oral arguments and briefs of counsel, and for the reasons set forth below, the court now enters the following Findings of Fact and Conclusions of Law in accordance with its obligations under the Federal Rules of Civil Procedure. See Fed. R. Civ. Proc. 52(c) (A judgment under Rule 52(c) "shall be supported by findings of fact and conclusions of law as required by subdivision (a) of this rule.").

FINDINGS OF FACT

I. The Parties

Plaintiffs David Fierro and Alejandro Gilbert Ruiz are prisoners who have been sentenced to death under the laws of the State of California and are imprisoned at San Quentin State Prison in San Quentin, California.

1. Although the court has attempted to avoid commingling findings of fact with conclusions of law, any conclusions that are inadvertently labelled as findings (or vice versa) shall be considered "in [their] true light, regardless of the label that the . . . court may have placed on [them]." Tri-Torn International v. A.A. Velto, 525 F.2d 432, 435-36 (9th Cir. 1975).

At the time of the filing of this action, plaintiff Robert Alton Harris was also a prisoner sentenced to death and housed at San Quentin. He was executed by the State of California on April 21, 1992, by the administration of lethal gas in the gas chamber at San Quentin State Prison. See Ex. 55 (Harris Execution Record).²

Defendant James Gomez is Director of the California Department of Corrections. Defendant Arthur Calderon is Warden of San Quentin Prison. He is the successor in that position to Daniel Vasquez, who was originally a defendant in this action.³ Defendants re employees of the State of California and at all times relevant to this action were acting as employees within the scope of their employment with the State of California.

II. Statutory Authorization For Executions In California

California has provided for execution by means of lethal gas since 1937; before that time, executions in the state were carried out by hanging. See People v. Righthouse, 10 Cal. 2d 86 (1937); Ex. 103 (California legislative materials). Between 1937 and 1967, California carried out numerous executions in the gas chamber. See Ex. 102 at 5, 11 (National Prisoner Statistics Bulletin) (reporting 292 executions between 1930 and 1970).

2. Plaintiffs' exhibits are designated by number alone. Defendants' exhibits are designated by the letter "A" followed by the exhibit number.

3. Defendants substituted defendant Calderon for defendant Vasquez on January 24, 1994, without objection from plaintiffs.

In 1972 in Furman v. Georgia, the Supreme Court set aside the death penalty, as it was then administered, on eighth amendment grounds. Furman v. Georgia, 408 U.S. 238 (1972). Subsequently, the Supreme Court reinstated the death penalty, holding that revised statutes did not violate the eighth amendment. Gregg v. Georgia, 428 U.S. 153 (1976).

Since the death penalty was reinstated in 1976, California has executed two inmates, Robert Alton Harris and David Mason. The State of California, through its agents Gomez and then-Warden Vasquez, executed plaintiff Harris on April 21, 1992, by administration of lethal gas. The sentence was carried out pursuant to California Penal Code section 3604, which at the time of that execution provided:

§ 3604. Method of execution; election

(a) The punishment of death shall be inflicted by the administration of a lethal gas or by an intravenous injection of a substance or substance in a lethal quantity sufficient to cause death, by standards established under the direction of the Department of Corrections.

(b) Persons sentenced to death prior to or after the operative date of this subdivision shall have the opportunity to elect to have the punishment imposed by lethal gas or lethal injection. This choice shall be made in writing and shall be submitted to the warden pursuant to regulations established by the Department of Corrections. If a person under sentence of death does not choose either lethal gas or lethal injection within 10 days after the warden's service upon the inmate of an execution warrant issued following the

operative date of this subdivision, the penalty of death shall be imposed by lethal gas.

(c) Where the person sentenced to death is not executed on the date set for execution and a new execution date is subsequently set, the person again shall have the opportunity to elect to have punishment imposed by lethal gas or lethal injection, according to the procedures set forth in subdivision (b).

(d) Notwithstanding subdivision (b), if either manner of execution described in subdivision (a) is held invalid, the punishment of death shall be imposed by the alternative means specified in subdivision (a).

Cal. Penal Code § 3604 (1994).

Between January 1, 1993 and October 14, 1993, twenty-four condemned inmates were served with execution warrants allowing them to elect lethal gas or lethal injection. Sixteen inmates refused to make a choice; seven selected lethal injection; and one selected lethal gas. See Ex. A-1 (Decl. of Denise Dull and attached choice forms).

David Mason, a condemned inmate at San Quentin, was served with an execution warrant but was one of the sixteen who refused to choose a method of execution. He was executed on August 24, 1993 by means of lethal gas. See Ex. 54A (Mason Execution Record).

Named plaintiff David Fierro was served with an execution warrant on February 9, 1993; he refused to select a method of execution. See Ex. A-1 (Fierro choice form). The record does not reflect that named plaintiff Ruiz has ever been served with an execution warrant.

Because one inmate has already been executed by lethal gas after refusing to choose a method of execution, and because other inmates, including plaintiff Fierro, have elected not to choose a method of execution or may in fact select lethal gas, the court finds that it is likely that inmates will be executed by the administration of lethal gas pursuant to California Penal Code § 3604(b), absent a ruling from this court.

III. Procedures For Execution By Lethal Gas In California

Executions by means of lethal gas in California are carried out in the gas chamber at San Quentin State Prison. Testimony of Warden Daniel Vasquez, 2 RT 59-60.⁴ The lethal gas used in the gas chamber at San Quentin is hydrogen cyanide, or hydrocyanic, gas. See Ex. 93A (redacted protocol); 2 RT 184, 121 (Vasquez); Testimony of Steven Baskin, 6 RT 61.

The procedures for such executions are detailed in San Quentin Institution Procedure No. 769 ("Lethal Gas Chamber, San Quentin State Prison"). See Ex. 52A (redacted protocol); Ex. 93A (redacted protocol); 2 RT 75 (Vasquez). Warden Vasquez testified that these procedures "are an outline" of the process and that there were slight deviations from the protocol in both of the recent California executions, that of Robert Harris and that of David Mason. 2 RT 143-44, 149-51 (Vasquez). The execution procedures were developed in the early 1980s by Warden Vasquez and his staff. In developing the procedures, Vasquez drew on the procedures that had been used for lethal gas

4. Citations to the Reporter's Transcript are designated by the volume number, the abbreviation "RT" and then the appropriate page numbers. The name of the witness testifying is also provided.

executions at San Quentin from 1937 to 1967. 2 RT 85-86 (Vasquez). Neither Warden Vasquez nor his staff consulted scientific experts or medical personnel in formulating the execution protocol, nor did they examine records from previous California executions. 2 RT 85, 87, 89 (Vasquez).

The gas chamber at San Quentin is a modified octagonal structure, approximately seven and one-half feet in diameter. See Ex. 41 at 3 (Decl. of Russell Stetler). The door to the chamber takes up one side; the other seven sides contain windows. Id.; Ex. 51 (floor plan of gas chamber).

The chamber is equipped with two chairs, referred to as Chair A and Chair B. See Ex. 51 (floor plan). During the execution of a single inmate, Chair b is used. 2 RT 71 (Vasquez). Chair B is to the left of Chair A when looking into the chamber from the door. See Ex. 51 (floor plan). Both Robert Harris and David Mason were executed in Chair B. 2 RT 95, 124 (Vasquez). There are straps on the back of each chair, which cross the inmate's chest and upper abdomen. Id. at 72. The chair also has two straps for each leg and three straps for each arm. See id. at 71-72; see also Ex. 89 (drawing of chair).⁵

At the base of each chair, directly under the seat, is a reservoir for holding a sulfuric acid-distilled water mixture. See Ex. 89 (drawing of chair); 2 RT 74 (Vasquez). There is also an armature designed to hold a cheesecloth bag containing sodium cyanide crystals. Id. Between the armature and the seat is a bedpan, the purpose of which is to catch the excretions of the condemned inmate. Id.; Ex. 89 (drawing of chair). In order to allow the lethal gas to rise, there are holes in the seats of the chairs. 2 RT 73 (Vasquez).

5. Exhibit 89 does not depict all twelve straps.

A Witness Observation Area surrounds the chamber on approximately five of the eight sides. Ex. 51 (floor plan). A circular railing rings the chamber. Id. The warden's official witnesses are allowed to stand at this railing, which is only a few feet from the chamber itself. See Ex. 51 (floor plan); Ex. 41 at 3-4 (Decl. of Russell Stetler); Ex. 42 at 5 (Decl. of David K. Li). Other witnesses stand on two-tiered risers, also located in the witness area, approximately six to eight feet removed from the chamber. See Ex. 51 (floor plan); Testimony of Martin Leon Harris, 1 RT 26. The views from the Witness Observation Area are of the inmate's side and back. Id. Media witnesses are on risers that afford a view of the right side of the inmate; the inmate's witnesses are placed on risers that provide a left-side view of the inmate. Ex. 41 at 4 (Decl. of Russell Stetler); 1 RT 26 (Harris); Ex. 39 at 4 (Decl. of Michael Kroll).

The Physicians' Observation Area encompasses the remaining area around the chamber -- namely, the door to the chamber and two additional windows. Ex. 51 (floor plan); 2 RT 62 (Vasquez). Inside the Physicians' Observation Area is a manometer, which measures pressure in order to ensure that there is a lower pressure inside the chamber than outside, thus preventing leakage of the lethal gas from the chamber. 2 RT 66-67 (Vasquez). Below the manometer, and immediately next to the chamber, is a red lever called the immersion lever. Ex. 88 (diagram of chamber); 2 RT 70 (Vasquez). When the lever is pushed, the armature beneath the chair lowers the cheesecloth bag of sodium cyanide crystals into the sulfuric acid mixture under the chairs. 2 RT 67, 74 (Vasquez).

Behind and to the side of the Physicians' Observation Area is the Mixing Room, where the chemicals for the lethal gas solution are prepared. See Ex. 51 (floor plan); Ex. 87 (drawing of controls); 2 RT 63 (Vasquez). It contains two mixing bowls that are

used to mix the sulfuric acid and distilled water. 2 RT 64-65 (Vasquez). The bowls are connected by pipe to the reservoirs under the chairs inside the chamber; one bowl empties into each of the two reservoirs. Id.⁶

Prior to an execution, a solution of one gallon and one pint of distilled water and two quarts and one pint of sulfuric acid is mixed in the mixing bowls. Ex. 93A (redacted protocol); 2 RT 93 (Vasquez). One pound of sodium cyanide crystals, wrapped in cheesecloth, is suspended above the reservoirs on the armature. Ex. 93A (redacted protocol).

The inmate is then strapped tightly into Chair B by prison guards. 1 RT 27 (Harris); 2 RT 95-96 (Vasquez); Ex. 93A (redacted protocol). Once the inmate is strapped to the chair, he or she can move only his or her head slightly from side to side and forward, and his or her fingers. 1 RT 30-31 (Harris). The acid/distilled water mixture is then released from the mixing bowls and carried, through a pipe, to the reservoirs under each chair. Ex. 93A (redacted protocol).

During the execution process, certain members of the "execution team" are present in the Physicians' Observation Area, including the Warden and two physicians. 2 RT 101-04 (Vasquez). During the execution, one member of the team pushes the immersion lever, lowering the crystals into the acid-water mixture. Ex. 93A (redacted protocol). This produces hydrocyanic gas, which rises and is inhaled by the prisoner.

One of the physicians in the Physicians' Observation Area observes the inmate through the two windows to the gas chamber. The physician is only a

6. The court also viewed the gas chamber at San Quentin State Prison and finds the foregoing evidence consistent with its observations.

few feet from the inmate and has a view of the front of the inmate. 2 RT 102 (Vasquez). The view is clear and unobstructed. Id. at 107. The observing physician contemporaneously records the information observed during the execution on an official Execution Record form. Id. at 107-08, 116. The other physician monitors the heart rate of the inmate by means of an electrocardiogram (EKG) machine located to the left of the door to the gas chamber in the Physicians' Viewing Area. Id. at 98.

IV. Plaintiffs' Experts

Plaintiffs presented their theory of the effects of cyanide on humans through four experts.

1) Kent R. Olson, M.D. Dr. Olson received his medical degree from University of California at San Francisco in 1978. He completed a one-year internal medicine residency at Mt. Zion Hospital in San Francisco in 1979 and completed a fellowship in clinical toxicology at San Francisco General Hospital and University of California at San Francisco in 1982. Testimony of Kent R. Olson, 1 RT 41; Ex. 63 (Olson Curriculum Vitae).

Dr. Olson is also a board-certified specialist in emergency medicine and medical toxicology and the Medical Director at the San Francisco Poison Control Center. The Poison Control Center serves a population of six to eight million people and is considered one of the premier poison control centers in the country. In addition, Dr. Olson teaches at the School of Pharmacy and the School of Medicine at the University of California at San Francisco. He is also a practicing emergency room physician at a regional trauma center. 1 RT 41-43 (Olson); Ex. 63 (Olson Curriculum Vitae). Dr. Olson is the editor of a well-respected clinical manual for physicians, entitled

Poisoning and Drug Overdose, 1 RT 49 (Olson), as well as a former Director of the American Board of Medical Toxicology. 1 RT 46 (Olson); Ex. 63 at 6 (Olson Curriculum Vitae).

As a medical toxicologist, Dr. Olson is trained in the diagnosis and treatment of acute poisoning, including poisoning by cyanide. 1 RT 41-42 (Olson). He is a member of both the Hazardous Materials Advisory Committee of the California Emergency Medical Services Authority and the Peer Review Committee of the United States Public Health Service Agency for Toxic Substances and Disease Registry. 1 RT 45 (Olson); Ex. 63 at 6 (Olson Curriculum Vitae). These committees are developing guidelines for the management of poisons, including cyanide, that might be involved in a hazardous materials spill. 1 RT 45 (Olson). Poisoning by cyanide is rare, but through his work at the Poison Control Center, Dr. Olson has seen some twenty to thirty such cases. 1 RT 47 (Olson).

The court found at trial that Dr. Olson was qualified to testify as an expert in the areas of medical toxicology, emergency room medicine, and the treatment and diagnosis of poisonings, including poisonings by cyanide. 1 RT 55-56.

2) John Friedberg, M.D. Dr. Friedberg is a board-certified neurologist, with a general neurologic practice in Northern California. Dr. Friedberg routinely examines and treats patients with problems related to every aspect of the central and peripheral nervous system. He has actively consulted in emergency rooms and in hospital wards in cases involving persons in various states of consciousness. Testimony of John Friedberg, 4 RT 57.

Dr. Friedberg received his medical degree from the University of Rochester in 1971. He then interned at the Pacific Medical Center in internal medicine and was a staff physician at General Hospital in Salinas.

In 1978, he completed a neurology residency at the University of Oregon. 4 RT 57-59 (Friedberg). He then returned to the Bay Area and worked for Kaiser-Permanente and as an emergency room consultant while developing his own private neurology practice. 4 RT 61 (Friedberg).

The court found at trial that Dr. Friedberg was qualified to testify as an expert neurologist with specialized skills in determination of consciousness and levels of pain. 4 RT 66-67 (Friedberg).

3) Richard Traystman, Ph.D. Dr. Traystman is the Vice Chair of the Department of Anesthesiology and Critical Care Medicine and Director of Research at the Johns Hopkins University School of Medicine. Testimony of Richard Traystman, 7 RT 133; Ex. 120 (Traystman Curriculum Vitae). Dr. Traystman received his doctorate in cardiopulmonary physiology from Johns Hopkins in 1971. Dr. Traystman joined the faculty at Johns Hopkins following completion of a two year post-doctorate in the Department of Physiology at Bowman Gary School of Medicine in 1972. 7 RT 133 (Traystman); Ex. 120 at 1-2 (Traystman Curriculum Vitae).

For the past twenty years, Dr. Traystman has been conducting research on the brain and the control of brain blood vessels, particularly the responses and reactivity of brain blood vessels to the deprivation of oxygen, or hypoxia. 7 RT 134 (Traystman). Dr. Traystman has published numerous articles on these and related subjects. 7 RT 137-40 (Traystman); Ex. 120 at 8-60 (Traystman Curriculum Vitae).

The court found at trial that Dr. Traystman was qualified as an expert in the areas of hypoxia and its effects on the heart and brain. 7 RT 140-41.

4) Robert Kirschner, M.D. Dr. Kirschner is board-certified in both anatomic and forensic

pathology, is a professor of pathology at the University of Chicago, and is currently the Deputy Chief Medical Examiner for Cook County, Illinois. He graduated from Jefferson Medical College in Philadelphia in 1966 and trained as a resident in pathology at the University of Chicago from 1967 to 1971. He thereafter became a commissioned officer in the Public Health Service and served at the Baltimore Cancer Research Center of the National Cancer Institute from 1971 to 1973. After an honorable discharge from the Public Health Service, he became an assistant professor at the University of Chicago in the Pathology Department, where he continues to teach. Ex. 84 at 8-14 (Deposition of Robert H. Kirschner).

In 1978, Dr. Kirschner joined the Cook County Medical Examiner's Office and has performed approximately 7,000 autopsies since that time. As noted above, cyanide poisonings are rare; however, Dr. Kirschner has conducted autopsies on four or five persons who have died in this manner. In addition, his office has been involved in the highly publicized Tylenol tampering cyanide poisoning case, as well as cyanide poisonings through industrial accidents and through suicides. *Id.* at 10-13. He has served on the Board of Directors of the National Association of Medical Examiners and has reviewed articles for publication in a number of prominent journals, including the Journal of the American Medical Association. *Id.* at 18-19.

By stipulation of the parties, Dr. Kirschner's testimony was presented by videotape. The court finds that Dr. Kirschner is qualified to testify as an expert on the physiological effects of cyanide on the body and the pain and suffering that may be caused as a result of the inhalation of cyanide gas.

V. Defendants' Experts

Defendants presented their evidence concerning the effects of hydrocyanic gas on humans through two experts.

1. Dr. Steven Baskin is a board certified toxicologist. He is currently employed as a scientist at the United States Army Medical Research Institute of Chemical Defense. He received a degree in pharmacy from the University of Southern California, a doctorate in pharmacology/toxicology from Ohio State University, and undertook post-graduate training, also in pharmacology/toxicology, at Michigan State University. Dr. Baskin has researched in the field of cyanide toxicology for at least twelve years, has edited several textbooks, and has authored over three dozen articles and chapters on the toxicology of cyanide. *See* 5 RT 7-11 (Baskin); Ex. A-3 (Baskin Curriculum Vitae).

In his current position with the Medical Research Institute, Dr. Baskin researches how cyanide could be used as a threat by terrorists or other forces antagonistic to the United States. Specifically, his research is designed to discover the mechanism by which cyanide works and to develop antidotes or prophylactic agents to be used to counter the effects of cyanide. 5 RT 9 (Baskin). Dr. Baskin is also an adjunct professor of the toxicology section of the department of pathology at the University of Maryland School of Medicine. 5 RT 8 (Baskin).

The court found Dr. Baskin to be qualified as an expert in pharmacology and toxicology, with an emphasis on the toxicology of cyanide. 5 RT 14.

2) Alan Hall, M.D. Dr. Hall is board certified in emergency medicine and medicine toxicology. Testimony of Alan H. Hall, 3 RT 5. He received his medical degree from Indiana University, interned at Thomason General Hospital in El Paso, Texas, and was then a resident in anesthesiology at the University

of Texas Health Science Center. Dr. Hall was a fellow for two years at the Rocky Mountain Poison and Drug Center in Denver. 3 RT 3 (Hall). although he does not currently practice emergency medicine on a regular basis, he still consults with the Rocky Mountain Poison Center. 3 RT 4 (Hall). Dr. Hall has been consulted on cases involving cyanide exposure and has published on the subject. 3 RT 14-17 (Hall).

The court found at trial that Dr. Hall is qualified to testify as an expert on the toxicology of cyanide and emergency medicine. 3 RT 19.

VI. Effects Of Hydrocyanic Gas On The Human Body --

Overview of the Theories²⁷

7. Neither party to this litigation raised issues regarding admissibility of the scientific evidence under Daubert v. Merrell Dow Pharmaceuticals, 509 U.S. ___, 113 S. Ct. 2786 (1993). The court also notes that in Campbell v. Wood neither the district court nor the Ninth Circuit subjected the scientific evidence admitted there to an explicit Daubert analysis. See Campbell v. Wood, 18 F.3d 662 (9th Cir.) (en banc). Nonetheless, this court believes that the Daubert standards should be acknowledged and their applicability determined.

The Daubert decision implicates three particular rules of the Federal Rules of Evidence -- Rules 104(a), 702 and 403. Rule 104(a) requires that the court preliminarily pass on the admissibility of scientific evidence and the qualifications of experts. If the expert is being called to testify to "scientific knowledge," the court must determine whether the proffered testimony qualifies as "scientific knowledge" and whether it will assist the trier of fact. If the evidence is found admissible, the court must perform the Rule 403 evaluation of probativeness versus prejudice or other

factors enumerated in Rule 403.

In this case, the qualifications of the experts were considered, and they were deemed qualified in their respective fields and permitted to opine on matters related to those fields. There is no question that their testimony would assist the court as trier of fact since the testimony went to the very issue to be decided by the court. It is also not disputed that the testimony of doctors, toxicologists and other scientists constitutes scientific knowledge. The testimony related to the well-accepted areas of science known as neurology, toxicology, anesthesiology, pathology, and pharmacology, and each of the theories or propositions presented was derived by scientific methods. However, whether a theory, in fact, constitutes scientific knowledge must be tested by standards such as (1) whether the theory can be or has been tested; (2) whether the theory has been subjected to peer review and publication; (3) the known or potential rate of error; and (4) the degree of acceptance of the theory within the scientific community. U.S.A. v. Rincon, 28 F.3d 921, 924 (9th Cir. 1994) (applying Daubert). While emphasizing that the inquiry must be directed at "principles and methodology," the Daubert court made it clear that the test of scientific reliability is flexible. Thus, these four factors are not exclusive of other relevant considerations that test the reliability of the scientific evidence. Daubert, 113 S. Ct. at 2798.

Although the "general acceptance" test of Frye v. United States, 293 F.2d 1013 (D.C. Cir. 1923), may no longer be used to exclude evidence, well-established scientific principles are less likely to be challenged and are more readily admissible than novel ones. Daubert, 113 S. Ct. at 2796 n. 11. Most witnesses in this case based their opinions on well-accepted principles of toxicology and neurology, principles regularly taught in medical school or found in treatises routinely treated as

authoritative in these fields. Presumably, these principles have been subjected to peer review and publication since they are regularly used by practitioners in the pertinent medical and scientific professions. Most significantly, they have a high degree of acceptance in the scientific community. Furthermore, the medical doctors who testified in this action uniformly testified to their profession's practice of relying upon observations. Their interpretations of the available first-hand observations were consistent with this body of well-accepted scientific and medical literature.

The theories espoused by Dr. Baskin are more problematic. Dr. Baskin has tested his theories with a number of animal experiments, most of which, as noted below, are of questionable probative value to the facts here. It should be noted that at least one animal study was published in a refereed journal, and some of his theories have begun to make their way into authoritative medical treatises. See, generally, Ex. 64 (Bryan Ballantyne & Timothy C. Marrs, Clinical and Experimental Toxicology of Cyanides 1987). These treatises acknowledge that the accepted scientific wisdom may be in dispute and that questions remain about all of the effects of cyanide upon the various bodily systems. Id. at 478.

Under Daubert, the court concludes that the better approach in this bench trial is to admit the testimony of all of the recognized experts that it permitted to testify and, in the words of the Supreme Court, allow "[v]igorous cross-examination, presentation of contrary evidence" and careful weighing of the burden of proof to test "shaky but admissible evidence." Id. at 2798. Further, the court's concerns about the usefulness of various portions of the scientific testimony more appropriately can be addressed through determination of the weight to be accorded the testimony, rather than

Cyanide affects many systems within the body. See, e.g., Ex. 64 at 41-42 (Bryan Ballantyne & Timothy C. Marrs, Clinical And Experimental Toxicology of Cyanides (1987)). The basic disagreement between plaintiffs' experts and defendants' experts concerns which of these effects occurs first for inmates in the gas chamber at San Quentin. Specifically, the point of disagreement is whether unconsciousness occurs within at most thirty seconds of inhalation, as defendants maintain, or whether, as plaintiffs contend, unconsciousness occurs much later, after the inmate has endured the painful effects of cyanide gas for several minutes.

Plaintiffs' experts generally testified that cyanide inhalation kills human beings by preventing the body's cells from using oxygen. A person inhaling cyanide continues to breathe oxygen, and that oxygen continues to be transported through the blood stream to the cells. However, cyanide binds to an enzyme system within the cells known as the cytochrome oxidase system, blocking the transfer of oxygen to the cells. 1 RT 56, 65 (Olson); 3 RT 58-62 (Hall); 7 RT 150, 211-12 (Traystman); 4 RT 86 (Freidberg).

through the threshold determination of admissibility.

Finally, the court notes that the very heart of the issue here is consciousness and pain, not liability and, therefore, causation. The inquiry necessitated by this action requires that the court hear testimony of qualified experts and weigh the strength of the examination and cross-examination in order to reach a determination. The court finds that the scientific testimony proffered in this case is properly admitted under Daubert and under Rule 403's balancing test.

This process suffocates the body's cells. Deprived of oxygen, the cells are unable to produce the energy they need to stay alive. They stop functioning and eventually die, leading ultimately to the unconsciousness and death of the organism. The result of this "cellular suffocation" thus is analogous to the result of suffocation due to drowning or strangulation. 7 RT 150 (Traystman); Ex. 84 at 20-22, 44-45 (Kirschner); 1 RT 56, 149 (Olson).

Plaintiffs' experts testified that cyanide-induced oxygen deprivation is experienced by the inmate as "intense suffocation" and "air hunger." 1 RT 56, 58-59 (Olson); Ex. 84 at 20-22 (Kirschner). During an execution by lethal gas, an inmate may lose and subsequently regain consciousness several times, drifting in and out of conscious experience of the suffocating effects of cyanide gas. 1 RT 172-73 (Olson).

In addition, since cyanide cuts off the normal ability of a cell to utilize oxygen, the cell is forced to use an inefficient backup system in an attempt to maintain critical levels of energy. A by-product of this backup system is lactic acid, which builds up in the cell, creating a painful condition known as acidosis. Plaintiffs' experts testified that this pain is similar to the pain accompanying intense physical activity or a heart attack. 1 RT 57-58 (Olson); 3 RT 81-82 (Hall); 4 RT 77-78 (Friedberg); 7 RT 205 (Traystman).

Plaintiffs' experts also maintained that cyanide inhalation can lead to tetany, a painful sustained muscular contraction or spasm. 3 RT 118-121 (Hall); 4 RT 68-69 (Friedberg); 1 RT 140 (Olson). Tetany may be manifested by opisthotonos behavior, muscular contractions so severe that the body is "arched backwards like a bridge," with contractions of sufficient force to "compass and fracture the vertebrae." 3 RT 1191 (Hall); 4 RT 68-69 (Friedberg); 1 RT 72 (Olson). Other possible manifestations of tetany include 1) carpal pedal spasm, in which the muscles of the hands

and feet contract so severely that they bend and twist in an unnatural and painful manner, 3 RT 120-21 (Hall), 4 RT 68 (Friedberg); and 2) "sardonic smile," in which the lip muscles are pulled tightly away from the teeth. See 4 RT 68 (Friedberg); 3 RT 121 (Hall); 1 RT 72-73 (Olson). To a conscious person, tetany is extremely painful. 4 RT 76-77 (Friedberg); 3 RT 123 (Hall); 1 RT 73 (Olson).

Finally, plaintiffs' experts testified that cyanide-induced oxygen debt causes the body to release very large amounts of adrenaline. 1 RT 141 (Olson); 7 RT 152 (Traystman). Although an inmate on the verge of being executed may generate some adrenaline as a result of fear, this effect is compounded by the lethal gas itself. 1 RT 141-42 (Olson); Ex. 64 at 151 (Bryan Ballantyne & Timothy C. Marrs, Clinical And Experimental Toxicology of Cyanides (1987)). This adrenaline discharge is painful, especially in association with the intense muscle activity and acidosis caused by cyanide poisoning. 1 RT 141-42 (Olson).

Defendants' experts painted a much different picture of death by cyanide gas. According to defendants, cyanide swiftly and simultaneously eliminates the energy in brain and heart cells, among others, causing the inmate to lose consciousness. 5 RT 12, 44-47, 6 RT 14 (Baskin). Furthermore, cyanide can combine with and inhibit carbonic anhydrase, the enzyme that controls cellular blood stream acidity, thereby severely limiting the ability of sensory nerves to transmit messages, including pain messages, to the brain. 5 RT 17 (Baskin); 7 RT 200-01 (Traystman); 3 RT 71, 80 (Hall). Defendants' experts further testified that the "calcium channel effect" also precedes interference with the ability of the cell to process oxygen. According to defendants, this effect produces rapid unconsciousness as well. 5 RT 24-28 (Baskin).

Finally, defendants maintain that lethal doses of cyanide cause a precipitous drop in phosphocreatinine

(PCr), a substance that acts as an energy reservoir in cells, particularly in heart and brain cells. This decrease prevents cells from using energy and suppresses the central nervous system, which in turn causes loss of consciousness within ten to thirty seconds. 5 RT 29-31, 35 6 RT 9 (Baskin).

According to defendants' experts, all of these effects on the heart and brain occur long before any effects on striated muscles occur because cyanide acts most quickly upon cells, such as neurons, that discharge with great frequency. 6 RT 36-37 (Baskin); 7 RT 147 (Traystman); see also Ex. 64 at 157 (Bryan Ballantyne & Timothy C. Marrs, Clinical And Experimental Toxicology of Cyanides (1987)). Although defendants' experts admitted that cyanide does interact with cytochrome oxidase, see, e.g. 5 RT 28 (Baskin), they contended that this interaction occurs only after loss of consciousness. For this reason, they argued that cellular suffocation is not analogous, in mechanism or result, to the experience of whole-body suffocation, such as by drowning or strangulation. 7 RT 41-42 (Baskin); 3 RT 62-65 (Hall).

VII. Supporting Evidence

A. Scientific Literature

Because hydrocyanic gas is highly toxic and lethal to human beings, 1 RT 114 (Olson), scientists have been limited in their ability to study its effects on humans. Cyanide poisoning cases in humans are rare. 1 RT 47, 53 (Olson). Theories of how cyanide gas affects the human body are therefore primarily based on 1) chemical studies; 2) data extrapolated from animal experiments; and 3) anecdotal accounts of human exposure to various forms of cyanide. 1 RT 85-86 (Olson).

The leading textbook on cyanide, cited extensively by both parties, recognizes that both the effects described by plaintiffs' experts and by defendants' experts may occur as a result of cyanide poisoning:

The signs of [hydrocyanic] vapor poisoning vary in their time to onset and severity, depending principally on the atmosphere concentration of [hydrogen cyanide]. Typical signs include rapid breathing, weak and ataxic movements, convulsions, loss of voluntary movement, coma, decrease in respiratory rate and depth, irregularities of breathing, and death.

Ex. 64 at 68 (Bryan Ballantyne & Timothy C. Marrs, Clinical and Experimental Toxicology of Cyanides 1987). Later, the same authority states that:

The signs and symptoms vary greatly with the route of exposure, total dose, time over which the dose is delivered, and the physical mode of presentation. These factors influence the effects observed, their magnitude, sequence of appearance, and duration. The following may be encountered: anxiety and excitement; rapid breathing; faintness; weakness; headache (pulsating); constricting sensations in the chest; facial flushing; dyspnoea; nausea and vomiting; diarrhoea; dizziness; drowsiness; confusion; convulsions; incontinence of urine and faeces; coma; respiratory irregularities.

With massive doses perorally or by high concentration inhalation exposure, many of the signs and symptoms listed above may not be seen, and there is a rapid onset of

poisoning with convulsions, collapse, coma and death.

Id. at 87 (citations omitted); see also id. at 159 ("[T]he range and severity of symptoms are related to the sensitivity of the individual poisoned, the dose and route of poisoning, and the time since exposure." (citations omitted)).

Furthermore, this authority makes clear that the method by which cyanide affects the body, and which system is affected first, is an unsettled question in the scientific community. Plaintiffs' theory of death through cellular suffocation has traditionally been the accepted viewpoint: "It is usually proposed that the major biochemical mechanism of action of cyanides, accounting for at least a significant part of its effects, is by the inhibition of cytochrome c oxidase activity." Id. at 478; see also Ex. A-15 at 687 (M. Matsumoto at al., "Role of Calcium Ions In Dopamine Release Induced By Sodium Cyanide Perfusion In Rat Striatum," 32 Neuropharmacology 681 (1993)). However, the leading textbook notes that "[r]ecently, the central role of cytochrome c oxidase inhibition in the toxicity of cyanide has been questioned." Ex. 64 at 478 (Bryan Ballantyne & Timothy C. Marrs, Clinical and Experimental Toxicology of Cyanides 1987) (citation omitted). The textbook acknowledges that cyanide inhibits many other enzyme systems and biological systems, as defendants contend. Id. at 42, 138, 159.

Perhaps not surprisingly, given the range and variation of symptoms shown in cyanide poisoning and given the dispute in the scientific community over the effects of cyanide at the cellular level, each side to this litigation is able to point to various anecdotal accounts and controlled studies in support of its theory. For instance, plaintiffs cite to accounts that show that tetany, followed by collapse and possible seizure

activity, has been recorded in humans who ingested cyanide. See Ex. 79 at 395 (Robert F. De Busk & Larry G. Seidl, Attempted Suicide By Cyanide, 110 California Medicine 394 (May 1969)); see also Ex. 64 at 299-30 (Bryan Ballantyne & Timothy C. Marrs, Clinical and Experimental Toxicology of Cyanides 1987) (describing similar reactions in individuals who consumed the cyanide-rich cassava root). Tetany has also been observed in monkeys injected with cyanide. See Ex. 106 at 140-41, 152 (J.B. Brierley, et al., Cyanide Intoxication in Macaca Mulatta, 31 Journal of Neurological Sciences 133 (1977)). Moreover, scientific studies support plaintiffs' theory that individuals deprived of oxygen made fade in and out of consciousness. See Ex. 76 at 397 (David Purser, et al., Intoxication By Cyanide In Fires: A Study In Monkeys Using Polycrylontrile, 39 Archives of Environmental Health 394 (November/December 1984)) (reporting waxing and waning of consciousness in hypoxic monkeys).

Although these accounts and studies provide support for plaintiffs' theory, they are far from conclusive. As plaintiffs themselves concede, it is difficult to extrapolate from animal studies to predict or make conclusions about the effects of cyanide on humans, especially given the lack of systematic studies on humans. See, e.g., 1 RT 81, 84-85 (Olson). Those journal articles that do concern the effects of cyanide on humans are based on post-hoc anecdotal accounts of exposure to unknown amounts of cyanide under uncontrolled circumstances, which limits their usefulness and reliability. See 1 RT 110-11 (Olson); 7 RT 80 (Baskin). In still other studies, additional factors cast doubt on how analogous the studied conditions are to the gas chamber at San Quentin. See, e.g., Ex. 106 (Brierley study) (monkeys that exhibited tetany had been lightly anaesthetized); 6 RT 33-35, 38-39, 56-57 (Baskin) (noting that anaesthesia

could have masked other effects); 7 RT 18-19, 284-85 (Baskin) (noting that cassava root incident was anomalous and effects seen could have been due to malnutrition).

Similarly, defendants were able to point to studies that indicate a lack of seizure activity, see Ex. A-11A (J. H. Wolfsie & N. J. Linden, Treatment of Cyanide Poisoning in Industry, AMA Archives of Industrial Hygiene and Occupational Medicine); that support the existence of the calcium channel effect, see Ex. A-15 (M. Matsumoto et al., "Role of Calcium Ions in Dopamine Release Induced By Sodium Cyanide Perfusion In Rat Striatum," 32 Neuropharmacology 681 (1993)); and even that suggest cyanide can have an analgesic effect, see Ex. A-14 (V. Tadic et al., "Endogenous Opioid Release: An Alternative Mechanism of Cyanide Toxicity," (copy on file with court)). As with plaintiffs' studies, however, these studies are difficult to analogize to the situation at San Quentin, since they rely on animal data or are otherwise of questionable relevance or reliability. See, e.g., 1 RT 111-12 (Olson) (questioning reliability of anecdotal reports); 7 RT 80 (Baskin) (same); 7 RT 247 (Baskin) (conceding Tadic article was never published in United States and may never have been subjected to peer review process).

The court finds that the scientific literature supports the hypothesis, which is for the most part undisputed, that cyanide affects many systems of the body. Although the cytochrome oxidase effect has traditionally been recognized as the chief mechanism by which cyanide acts, the primary of this effect has been called into question in recent years. Scientists are just now beginning to probe the other effects of cyanide. Few controlled experiments have been performed to document the timing of these various effects, and there are none that can be reliably compared to the conditions at San Quentin. The

scientific literature thus cannot answer the key questions in this action: which effects are felt first, and whether unconsciousness sets in quickly under the conditions present in the San Quentin gas chamber.

B. Lethal Doses Of Inhaled Cyanide

Defendants attempted to bolster their theory by reference to the lethal dose of cyanide. In toxicological terminology, an LD-50 is the dose of a poison required to kill 50% of an exposed population. 1 RT 77 (Olson). However, this measure provides no insight into how long it may take for death to occur, nor into the degree of pain experienced during that time. 1 RT 77-79 (Olson); 3 RT 102 (Hall).

For obvious reasons, the LD-50 dosage for humans has never been systematically studied, and scientists can only estimate what dose of cyanide may constitute a lethal dose. Estimates of lethal dose levels for humans are generally based on data extrapolated from animals. See, e.g., 6 RT 24-25 (Baskin); Ex. 68 at 11 (Stanford Moore & Marshall Gates, "Hydrogen Cyanide and Cyanogen Chloride," Chemical Warfare Agents and Related Chemical Problems Summary of Technical Reports of Division 9, NDRC 1946); Ex. 67 at 5, 11, 19 (B. P. McNamara, "Estimates of the Toxicity of Hydrocyanic Acid Vapors in Man," Edgewood Arsenal Technical Report 1976). Both parties conceded that such extrapolation may compromise the accuracy of any figure. See 7 RT 25 (Baskin). Furthermore, published estimates of lethal dose levels are often calculated for medical assessment purposes or for occupational safety reasons, and therefore may be systematically conservative. The medical and scientific literature is replete with anecdotal studies of individuals who have survived delivery of doses of cyanide that are substantially greater than the general estimates of lethality. See,

e.g., Ex. 65 (Joseph Barcroft, "The Toxicity of Atmospheres Containing Hydrocyanic Acid Gas," 31 Journal of Hygiene 1 (19310); Ex. 64 (Bryan Ballantyne & Timothy C. Marrs, Clinical and Experimental Toxicology of Cyanides 1987); Ex. 79 (Robert F. De Busk & Larry G. Seidl, "Attempted Suicide by Cyanide," 110 California Medicine 394 (May 1969)). For those reasons, it is impossible to pinpoint the lethal dose level for humans.

Defendant's expert, Dr. Baskin, estimated that the approximate LD-50 dosage for humans is 1.8 milligrams per kilogram of body weight. 6 RT 24-25 (Baskin). In calculating the dosage delivered in the San Quentin gas chamber, Dr. Baskin used the more conservative figure of 2.2 mg/kg that is often cited in the literature on cyanide. See Ex. 67 at 7 (B.P. McNamara, "Estimates of the Toxicity of Hydrocyanic Acid Vapors in Man," Edgewood Arsenal Technical Report 1976) (applying Moore & Gates). Based on this figure, Dr. Baskin estimated that a does of between 4 and 10 LD-50's is delivered at San Quentin.⁸

8. Dr. Baskin reached his conclusions concerning the dosage level at San Quentin in party by relying on the "Whitecavage Report," a study performed for the purpose of this litigation in the actual gas chamber. Ex. A-5. mr. Whitecavage, who ran the experiment, was never called as a witness to lay a foundation for the report. The court accordingly deemed the report hearsay and admitted it into evidence only as hearsay relied upon by an expert in forming his opinion, and not for the truth of the matter asserted. See 8 RT 25-29. The court notes further that the report suffered from a grievous lack of scientific controls, was riddled with errors and inconsistencies, and is generally a questionable basis for expert opinion. See generally 7 RT 89-130,

Although the precise does delivered at San Quentin cannot be reliably determined, the court finds it is well in excess of a lethal dose. although this finding tends to support defendants' view that death in the gas chamber at San Quentin occurs relatively quickly, it is far from dispositive. Compared to a very small does of cyanide, which may not cause death until 30 minutes to one hour of exposure, a large does of cyanide does produce relatively rapid unconsciousness and death. See Ex. 67 (B. P. McNamara, "Estimates of the Toxicity of Hydrocyanic Acid Vapors in Man," Edgewood Arsenal Technical Report 1976). However, the time increments crucial to this litigation are small - - the difference between several seconds and several minutes -- and defendants' evidence does not demonstrate that the dose administered at San Quentin is so strong as to produce immediate unconsciousness and/or death.

C. San Quentin Observations

Against this backdrop of uncertainty in the scientific community, plaintiffs have presented extensive evidence concerning observations made by witnesses to lethal gas executions, at San Quentin and elsewhere. This evidence includes contemporaneous records made by medical personnel attending executions at San Quentin since 1937, see Ex. 53 (Execution Records), as well as media accounts and accounts of other eyewitnesses.

220-44 (Baskin) (describing methodology used for Whitecavage Report). Dr. Baskin's reliance on this seriously flawed study leads the court to question his expert opinions on this specific subject, and diminishes the court's general assessment of his professional judgment.

This evidence, too, is sometimes difficult to interpret, as both parties readily conceded. Neither consciousness nor pain is easy to gauge. Actions that appear to be volitional or appear to be a reaction to pain may in fact be unconscious and non-volitional. 1 RT 108-09 (Olson). a physician cannot be certain a person is unconscious unless that person is completely flaccid, with no body movements. 1 RT 98 (Olson).² Furthermore, even if a person is conscious, it may be difficult for an observer to tell if that person is experiencing pain, and, if so, the extent of that pain. As one expert put it, there is no "pain-o-meter." 3 RT 40, 46 (Hall); see also 1 RT 160-61 (Olson).

The difficulties of measuring pain and consciousness are compounded by the unnatural context of the San Quentin gas chamber, in which the individual under observation is physically separated from the observer. Under normal clinical circumstances, a physician might attempt to stimulate a patient through touch or sound in order to gauge the level of consciousness. This type of manipulation is not possible during the execution of an inmate. See 4 RT 63-64 (Friedberg).

With these caveats in mind, the court finds that all the evidence of eyewitness observations of gas chamber executions is probative, although to varying degrees. The official San Quentin execution records, especially considered in the aggregate, are reliable sources of clinical information. They were created contemporaneously with the actual executions, by trained medical personnel observing the inmates from a distance of only a few feet. Practicing physicians

9. Moreover, even a person who looks completely unconscious, is completely immobile, and has completely flaccid muscle tone may respond to a painful stimulus. 1 RT 70 (Olson).

commonly rely on such observations, particularly when the observations are made by medical personnel. 4 RT 63-64 (Friedberg); see also Ex. 84 at 25-26 (Kirschner); 1 RT 114, 130, 155 (Olson). As one of defendants' experts stated, objective observations by medical doctors are better than any theoretical conclusions based on assumptions. 3 RT 118 (Hall); see also 7 RT 285 (Baskin); 1 RT 114 (Olson) (noting superiority of execution records over other evidence).¹⁰

The court finds that the executions records of David Mason and Robert Harris present the most probative evidence of pain and consciousness experienced at San Quentin executions, since these two inmates were executed according to the protocol that is presently under challenge.

Although the procedure used in the San Quentin executions from 1937 to 1967 is not known with certainty, the records of those executions are nonetheless highly probative as well. Many of the crucial factors relating to executions at San Quentin have been unchanged over the decades. The actual gas chamber itself is identical. Moreover, as noted above, Warden Vasquez testified that the protocol

10. The court recognizes that even these observations from medical personnel may not be entirely objective and dispassionate accounts of the executions. First, an execution is necessarily an emotionally-charged event, even for those accustomed to dealing with life and death issues on a daily basis. Second, the medical personnel were enlisted to record their observations by San Quentin State Prison and therefore may have had an incentive to minimize the amount of pain and consciousness experienced by the inmates. Either or both of these factors may have influenced those creating the records.

presently in place is based on procedures that ere in place when the Supreme Court struck down the death penalty in Furman. In addition, the form of the execution records maintained by the medical personnel has remained relatively consistent over the years, facilitating easy and accurate comparison to execution records generated under the current protocol. The records provide a space for the attending physician to record, among other occurrences, when the following events occur: "Sodium Cyanide Enters"; "Gas Strikes Prisoner's Face;" "Prisoner Apparently Unconscious"; "Gas Strikes Prisoner's Face"; "Prisoner Apparently Unconscious"; and "Prisoner Certainly Unconscious" and "Last Bodily Movement." As one would expect assuming similar procedures, the observations by medical personnel of the pre-Furman executions are consistent with the observations recorded for the mason and Harris executions.¹¹

11. The court is aware that in the recent case of Campbell v. Wood, the district court, in determining whether Washington State's method of hanging was unconstitutional, limited evidence to those executions carried out under the specific hanging protocol under challenge, a limitation that was upheld on appeal. Campbell, 18 F.3d at 685-86. However, the exclusion of that evidence wa based on the district judge's finding that evidence of other random bungled hangings "could not be reliably compared to Washington's method." Id. at 685. While the Ninth Circuit fund no abuse of discretion in this evidentiary exclusion, it noted hat evidence of hangings where the protocol used could be deduced or estimated "could arguably have been admitted" Id. at 686. For the reasons set forth above, this court finds that pre-Furman executions in California are readily comparable to those performed according to the current protocol and thus evidence concerning those executions

The court further finds that the observations of lay witnesses (i.e., non-medical witnesses) are relevant to a determination of pain and consciousness, although somewhat less probative than the observations of medical personnel. Experts of both parties testified that observations of lay witnesses describing behaviors and movements also constitute objective data upon which medical judgments are based, although they may be less reliable than observations of medical personnel. Ex. 84 at 25-28 (Kirschner); 1 RT 88-89, 159-62 (Olson); 3 RT 114 (Hall).¹²

1. Execution Of Robert Harris

Robert Alton Harris was put to death by administration of lethal gas at San Quentin on April 21, 1992.

Dr. Q. E. Crews was the attending physician who filled out Harris' execution record. Ex. 55A (Harris Execution Record). Crews did not record apparent unconsciousness until two minutes after the cyanide gas hit Harris' face and did not record certain

is not only admissible but highly relevant.

12. As with the observations of medical personnel, the court recognizes that some lay witnesses may have been more objective and dispassionate than others. For instance, some of the lay witnesses who testified or submitted declarations had personal relationships with those whom they saw put to death. See, e.g., 1 RT 1538 (testimony of Rev. leon harris, cousin of Robert Harris); Ex. 5 (Decl. of James J. Belanger, attorney of Don Eugene Harding); Ex. 2 (Decl. of Dennis N. Balske, attorney of Jimmy Lee Gray). In general, the court gave much less weight to this testimony, finding that these witnesses' observations were necessarily shaded by the passion of an emotionally-charged event.

unconsciousness until one minute later. See id. The media accounts of Harris' execution are consistent with this record. See generally Ex. 55B (news accounts of Harris execution); Ex. 70 (chart summarizing observations).¹² The media accounts further record movements that appeared to be volitional during this time. For instance, Richard Polito of the Martin Independent Journal reported that Harris raised his head and looked both ways and towards the ceiling more than two minutes after he began inhaling the lethal gas. Ex. 558B (Richard Polito, "Harris saga finally ends," The Marin Independent Journal, April 22, 1992, p. A1); see also id. (Sam Stanton, "Eyewitness: Harris' violent life ends quietly," The Sacramento Bee, April 22, 1992, p. A1) (noting head moving back and forth, deep breaths within two minutes of initial inhalation of lethal gas); Ex. 38 at ¶ 28 (Decl. of Craig W. Haney) (same); 1 RT 94-96 (Olson) (movements described are consistent with consciousness); 7 RT 168-70 (Traystman) (same).

2. Execution of David Mason

David Mason was executed in the gas chamber at San Quentin on August 24, 1993. See Ex. 54A (Mason Execution Record).

Again, the attending physician was Dr. Crews. Crews did not record apparent unconsciousness until one minute after Mason began breathing the gas; certain unconsciousness was not noted for an additional two minutes. See Ex. 54A (Mason Execution Record). The media observations appear to confirm that consciousness persisted for between one

13. Although some of the media witnesses reported longer durations of apparent consciousness, none reported shorter durations than the attending physician.

and three minutes. See Ex. 69 (chart summarizing observations); Ex. 54B (Kevin Fagan, "Mason Died As He Said He Would," San Francisco Chronicle, August 25, 1993, p. A1) (noting unconsciousness after three minutes); id. (David K. Li, "Watching Mason's Death," Oakland Tribune, August 25, 1993, p. A1) (suggesting consciousness at least as long). Witnesses also reported apparently volitional acts during this time. See id. (Anne Krueger, "Killer Executed," San Diego Union-Tribune, August 24, 1993, p. A1) (noting initial deep breaths, "as if he wanted to die quickly," and slow head movements); id. (Fagan) (noting initial deep breaths); 1 RT 96-99 (Olson) (suggesting media accounts describe conscious behavior).

Moreover, many of Mason's apparently conscious actions appeared to be responses to pain. See Ex. 42 (Li) (noting hands "clenched into tight painful fists"); 4 RT 82 (Friedberg) (clenching of fists is conscious response to pain); Ex. 43 (Ginsburg Decl.) ("His head was thrown back again, his mouth drew open. His eyes closed, his throat looked as if every muscle in it were strained."); 1 RT 109 (Olson) (describing such a reaction as consistent with painful opisthotonos posturing of tetany).

3. Pre-Furman Executions

The records of the executions at San Quentin, made by physicians attending for the express purpose of recording the inmates' reactions to the execution, reflect that consciousness generally persists anywhere from 15 seconds to one minute after the gas first strikes an inmate's face. Ex. 53 9 Execution Records); see also 4 RT 90 (Friedberg) (average time from when gas strikes face to apparent unconsciousness was 1.57 minutes over 120 executions). In some cases, the attending physicians recorded "apparent unconsciousness" much later. The interval from when

the lethal gas struck the inmate's face to "certain unconsciousness" varies to an even grater degree, with times ranging from 15 seconds to 5 minutes. See Ex. 53 (Execution Records).

The times recorded for apparent and certain unconsciousness are supported by notations made by the attending physicians which record movements of seemingly conscious behavior. See Ex. 84 at 30 (Kirschner Testimony) (noting that records of inmates struggle against bonds appear to be conscious activity); 3 RT 116 (Hall) (conceding same). Movements consistent with cyanide-induced tetany have also been recorded during the time of apparent consciousness. 4 RT 75 (Friedberg) (carpal pedal spasms consistent with tetany); 1 RT 109 (Olson) (descriptions of inmates arching back consistent with opisthotonos posturing of tetany); 4 RT 74-75 (Friedberg) (quivering of jaw observed consistent with trismus, a symptom of tetany).

The eyewitness accounts and official medical reports of numerous pre-Furman executions in the San Quentin gas chamber are consistent with the accounts of the executions of Harris and Mason. Many records indicate activities by the inmate that appear to be volitional.¹⁴ For instance, the attending physician recorded that Aaron Mitchell, executed in San Quentin's gas chamber on April 12, 1967, was apparently conscious at least 3 minutes and possibly 5 minutes after the gas struck his face. See Ex. 62A (Mitchell Execution Record); Ex. 8 (Decl. of Howard Brodie) (describing "star[ing]" and clenching hands with

14. The medical personnel making the execution records clearly did not consider every movement to be conscious or volitional. Consistently, the time recorded on the execution records for "last bodily movement" is well beyond the time of "apparent" and "certain" unconsciousness. See Ex. 53 (execution records).

thumbs inside during this time); Ex. 28 (Decl. of Charles Raudebaugh) (same); 1 RT 100-01 (Olson) (testifying that such activity is probably volitional); Ex. 36 (Decl. of Lawrence Wilson, former Warden of San Quentin) (head rocked up and down several times). Billy Wesley Monk, executed on November 21, 1961, was described by a San Quentin Correctional officer as "thrashing about in search of oxygen very much like a fish out of water." Ex. 3 at 1 (Decl. of Michael William Basten). Caryl Chessman, executed on May 2, 1960, was described as straining violently against the straps, rapidly clenching his hands, and snapping his head back and forth. Ex. 1 at 2-3 (Decl. of John R. Babcock); see also 1 RT 96, 100 (Olson) (looking side to side is consistent with consciousness); 4 RT 82-83 (Traystman) (rapid clenching of hands is consistent with consciousness and pain). For additional instances of similar behavior, see Ex. 53 (Avery Execution Record) (appears to obey officer's instruction to breathe deeply about one minute after gas strikes prisoner's face); Id. (Busch Execution Record) (fists clenched one minute after gas strikes face); Id. (Duncan Execution Record) (same); Id. (Dunn Execution Record) (prisoner is "struggling" as gas strikes face); Id. (Santo Execution Record) ("grimaces and strains at chair straps" around time when gas strikes face); Id. (Zilbauer Execution Record) (hands clenched about 45 seconds after gas strikes face).

VIII. Additional Findings

The scientific literature, the expert testimony, the eyewitness declarations and, above all, the contemporaneous medical records detailed above compel the conclusion that inmates executed in the gas chamber at San Quentin are not rendered immediately unconscious, as defendants contend.

While defendants offered theoretical evidence as to why inmates in the gas chamber should lose consciousness within seconds, they made little attempt to square this theory with the numerous objective eyewitness observations and contemporaneous medical records submitted by plaintiffs. It is theoretically possible to interpret any of the seemingly conscious activities cited above in isolation as the actions of an unconscious inmate. However, the execution records in the aggregate point unmistakably to the conclusion that consciousness persists for a number of seconds, if not minutes, and that pain is experienced during this time.

Defendants primarily relied on the testimony of Dr. Baskin. While Dr. Baskin has had a great deal of experience in cyanide research, the court finds that his testimony was based to a large extent on his own theoretical assumptions and that it failed to account for the real-world data of the San Quentin execution records. Most, if not all of the studies that Dr. Baskin has performed, and on which he based his conclusions, were animal studies and/or research designed to develop antidotes or prophylactic agents to be used to counter the effects of cyanide. 5 RT 9, 7 RT 77-84 (Baskin). Dr. Baskin also studied the EKG of Mason's heart activity during his execution, and claimed to have determined that the electrically regulated "p-wave" was lost and unconsciousness must have set in within 20 to 30 seconds of the first breath of cyanide gas. 5 RT 41-43, 47 (Baskin); see also 5 RT 42-44, 47, 7 RT 38, 82 (Baskin) (testifying about identical p-wave effect in EKGs of North Carolina prisoner and of subjects in Wexler study). As noted above, however, the attending physician at the Mason execution did not record "apparent unconsciousness" until a full minute after the gas hit Mason's face, and did not note "certain[] unconsciousness" until two additional minutes had elapsed. Dr. Baskin's post-hoc, theoretical reading

of the EKG cannot be considered reliable in the face of contemporaneous accounts of consciousness by the attending physician.

Even if Dr. Baskin were correct in the individual case of Mason in concluding that consciousness was lost within a few seconds, the court finds it impossible to extend this conclusion to all of the execution records. After a certain point, Dr. Baskin's attempt to explain away all of the possibly conscious activity begins to look less like the rational thought process of a detached scientist and more like the biased rationalizations of a professional who is wedded to his own particular theories. See, e.g., 7 RT 266-68 (Baskin) (discussing Harris execution).

This is especially so given that defendants' theory that cyanide affects other systems of the body sooner than the cytochrome oxidase system is precisely that: a theory. Defendants concede that the cytochrome oxidase effect does occur. See 5 RT 28 (Baskin); Ex. A-7 (Baskin's schematic, listing cytochrome oxidase as "a primary toxic site"). Dr. Baskin even conceded that medical schools currently teach this theory. 5 RT 21-22 (Baskin). Although Dr. Baskin disputed the primacy of cytochrome oxidase, he also stated, "I'm not sure what the primary toxic site is exactly." 5 RT 21 (Baskin). Given this uncertainty, Dr. Baskin's, and defendants', adamant position in the face of the eyewitness observations of actual inmate executions is somewhat surprising.

In a particularly revealing moment in the testimony, Dr. Baskin was questioned about his refusal to euthanize rabbits for experiments by injecting them with air bubbles, after watching such a form of euthanasia on one occasion. Dr. Baskin conceded that he did not run an objective test to determine whether the injected rabbit was experiencing pain (i.e., the "tail flick test"). Rather, in response to counsel's question, "[H]ow do you know it was a painful death?", Dr.

Baskin responded "[y]ou had to be there," and explained that seeing the animal and hearing the sounds it made was enough to convince him that the manner of death was painful. 7 RT 269 (Baskin). The court recognizes, as do all the experts and the scientific literature, that appearances of pain and consciousness can be deceiving. Nonetheless, in some cases scientists and medical personnel are forced to rely on objective appearances as a measure of pain. Unfortunately, Dr. Baskin displayed greater familiarity with this phenomenon as it related to rabbits than to human beings.

In sum, based on the evidence presented at trial, the testimony of the experts and the scientific literature introduced as exhibits, the court finds that inmates who are put to death in the gas chamber at San Quentin do not become immediately unconscious upon the first breath of lethal gas. The court further finds that an inmate probably remains conscious anywhere from 15 seconds to one minute, and that there is a substantial likelihood that consciousness, or a waxing and waning of consciousness, persists for several additional minutes. During this time, the court finds that inmates suffer intense, visceral pain, primarily as a result of lack of oxygen to the cells. The experience of "air hunger" is akin to the experience of a major heart attack, or to being held under water. See 1 RT 145 (Olson). Other possible effects of the cyanide gas include tetany, an exquisitely painful contraction of the muscles, and painful build-up of lactic acid and adrenaline. Cyanide-induced cellular suffocation causes anxiety, panic, terror, and pain. See, e.g. 4 RT 78 (Freidberg); 7 RT 205 (Traystman); Ex. 84 at 21, 44 (Kirschner); 1 RT 101, 149-50 (Olson).

IX. Legislative Trends In The United States Regarding Execution Methods

In addition to evidence concerning the pain experienced by inmates in the San Quentin gas chamber, plaintiffs also presented evidence concerning the trend away from use of the gas chamber as a means of execution. This evidence was presented through the testimony of plaintiffs' expert Franklin E. Zimring.

Mr. Zimring is the Simon Law Professor of Law and the Director of the Earl Warren Legal Institute at the University of California, Berkeley. 3 RT 138 (Zimring); Ex. 98 at 1 (Zimring Curriculum Vitae). Professor Zimring received his J.D. from the University of Chicago in 1967, whereupon he joined the faculty at the University of Chicago Law School. He taught there until 1985, when he began teaching at the University of California, Berkeley Law School. 3 RT 138 (Zimring); Ex. 98 at 1 (Zimring Curriculum Vitae).

Professor Zimring has served as a consultant to the American Bar Foundation, the Police Foundation, the National Commission on Reform of Federal Criminal Laws, the United States Department of Justice, the Federal Parole Commission, the Federal Bureau of Prisons, the General Accounting Office and the States of Alaska, California, Illinois, Nebraska, Virginia, and Washington. Ex. 98 (Zimring Curriculum Vitae).

Professor Zimring has conducted numerous empirical studies on the criminal justice system, which have been funded by a variety of organizations and government agencies, including the California Attorney General's Office, the Ford Foundation, and the United States Department of Justice. At least two of his empirical studies relate to the existence and administration of capital punishment. As part of one of these works, Professor Zimring analyzed legislative shifts in methods of execution in the United States since 1976. 3 RT 139-44 (Zimring).

The court found at trial that Professor Zimring was qualified to testify as a criminal justice policy expert with a particular expertise in the area of analyzing legislative changes regarding capital punishment. 3 RT 144 (Zimring).

The following findings are based on the evidence presented at the time of trial. The court takes judicial notice, however, of the fact that since that time there have been further legislative changes that support Professor Zimring's testimony and analysis. Most notably, at the time of trial, Maryland law authorized execution only by lethal gas. Ex. 102 (Methods of Execution) (citing Md. Ann. Code, art 27 § 627 (1987)). The Maryland state legislature recently enacted legislation, however, providing that execution is now to be carried out by lethal injection, except for inmates sentenced before the enactment of the legislation who affirmatively choose to be executed by lethal gas. Md. Ann. Code, § art 27 § 627 (1994).

There is a national consensus rejecting the use of the gas chamber as an acceptable method of execution. Since capital punishment was reenacted following the United States Supreme Court's decision in Gregg v. Georgia, 428 U.S. 153 (1976), the overwhelming majority of states that used cyanide gas as a method of execution prior to Gregg have abandoned or rejected the use of lethal gas as a method of execution.

In 1970, lethal gas was the second most widely used method of execution, following the electric chair. Ex. 102 (Methods of Execution); 4 RT 6 (Zimring). In 1970, thirty-nine states had death penalty statutes, and lethal gas was the sole method of execution provided for by statute in ten of these states: Arizona, California, Colorado, Maryland, Mississippi, Missouri, Nevada, New Mexico, North Carolina, and Wyoming. Ex. 102 (Table); see also Ex. 99 (Table); 3 RT 150 (Zimring).

At the time of trial, thirty-six states imposed the death penalty; only one state, Maryland, still retained lethal gas as the sole method of execution. Ex. 102 (Table); 3 RT 152 (Zimring).¹⁵ Two states, California and North Carolina, had statutes that provided for executions by means of lethal gas, unless the prisoner affirmatively chose to be executed by lethal injection. Cal. Penal Code § 3604; N.C. Gen. Stat. § 15-187. In Mississippi, lethal gas will be used as a method of execution only if the prisoner is sentenced before a date certain. Once all persons sentenced before that date have been granted relief or are executed, lethal injection will be the sole means of execution employed in this state. Miss. Code Ann. § 99-19-51. Similarly, in Arizona, a prisoner will be executed by lethal gas only if he or she has been sentenced before a date certain and affirmatively elects to be executed by lethal gas. Ariz. Rev. Stat. Ann., Ariz. Const. Art. 22 § 22.

Missouri's current statute provides that either lethal gas or lethal injection may be used as a method of execution. Mo. Ann. Stat. § 546.720. However, after Missouri's statute was amended in 1988 to add lethal injection as a method of execution, the Missouri Attorney General issued an opinion stating that lethal injection could be used to execute those sentenced to death prior to the effective date of the 1988 amendments. Mo. Op. Att'y Gen. No. 138-88 (Sept. 9, 1988). Missouri has not conducted a lethal gas execution in the post-Gregg era. See Ex. 99 at n. 3 (Table).

Lethal gas is not considered an innovative method of execution. From 1970 until the time of trial, twenty-five states had changed or added a method of

15. As noted above, Maryland now provides for execution either by gas or by lethal injection.

execution. No state had adopted lethal gas as a method of execution during this time. Rather, each of these twenty-five states either added lethal injection as a method of execution or changed to lethal injection as the sole method of execution. Ex. 102 (Table); 3 RT 147 (Zimring).¹⁶

Among those states other than California¹⁷ that had capital punishment in 1970 and continue to have a death penalty at present, the abandonment of the gas chamber as a means of execution is dramatically higher than the abandonment of other means of execution. Professor Zimring testified that of the twenty-five states that in 1970 had a method of execution other than lethal gas – electrocution, hanging, or firing squad – fourteen, or 56 percent, had changed to another method (always lethal injection), or to some combination of the old method and another method, by the time of trial. In comparison, all but one of the states that had lethal gas as a method of execution in 1970 had changed their method of execution. Ex. 99 (Table); 3 RT 153-54 (Zimring).¹⁸

16. Maryland's recent change brings this number to twenty-six.

17. Because the California legislature's decision to modify the state's method of execution to add the option of lethal injection may have been in part a result of this litigation, see Ex. 103 (Senate Committee on Judiciary Analysis of 1991 Cal. Assembly Bill No. 2405 as amended June 3, 1992, in preparation for hearing date of June 9, 1992), Professor Zimring did not include California in his statistical studies. For the same reason, the court has not included California in these findings. Nevertheless, the deletion of California from the above analysis, if anything, makes them more conservative than they would be if California were included.

18. Maryland, the lone exception, has now joined

Similarly, the abandonment of gas as a means of execution has been more pronounced than the abandonment of electrocution, the other most widely used method in 1970. 3 RT 154-55, 157-58, 4 RT 7 (Zimring). Of the nineteen states that had electrocution as the sole means of execution in 1970 and retained capital punishment as of the time of trial, eleven states, or fifty-eight percent, retained electrocution as a sole means of execution. In contrast, as stated above, only one of the nine states, or eleven percent, of states other than California retained lethal gas as the sole method of execution. Ex. 100 (Table). This difference is statistically significant. 3 RT 161 (Zimring).¹⁹

The experience of a gas execution appears to have a very different effect on legislative behavior than the experience of an execution by electrocution. Ex. 101 (Table); 3 RT 161-63 (Zimring). Of those states, other than California, that had gas as a means of execution in 1970, three of nine had used the gas chamber to execute an inmate as of the time of trial. None of those states had retained lethal gas as a sole means of execution. Of the electrocution states, seven actually used the electric chair after 1970 and six, or eighty-five percent, had retained electrocution as a sole means. Ex. 101 (Table 3); 3 RT 157-58 (Zimring). The difference between zero percent and eighty-five percent is statistically significant. 3 RT 159-61 (Zimring).²⁰

with the other states in shifting towards lethal injection.

19. Once again, Maryland's recent change reduces to zero the number of states with lethal gas as the sole means of execution.

20. North Carolina recently experienced a gas execution. See infra note 21. At the time, however, that state already provided that an inmate could elect

The pattern seen with electrocution states reflects the powerful force of legislative inertia; the movement away from lethal gas deviates dramatically from the expected pattern. 3 RT 155, 157-58 (Zimring).

As of January 12, 1994, 226 persons had been executed since Gregg v. Georgia. Of this total, only eight executions (or less than four percent) had been conducted by the administration of lethal gas.²¹

The legislative histories, newspaper accounts of legislative changes, and public opinion polls regarding the movement away from lethal gas as a method of execution are consistent with the finding that there is a national consensus against lethal gas executions. Ex. 103 (California legislative material); Ex. 104 (other states' legislative materials); see also 3 RT 165, 4 RT 44 (Zimring). A major recurrent theme throughout the discussions regarding the abandonment of the gas

between gas or lethal injection.

21. There have been several more executions since that date. See Gordon, "Is This The First Step Back To Public Execution," Daily Mail, June 16, 1994 (noting a total of 244 post-Gregg executions). To the court's knowledge, only one of these additional executions has been carried out through administration of lethal gas. See "Killer Executed After Losing Videotape Request," New York Times, June 16, 1994, p. A23 (describing North Carolina's June 15, 1994 lethal gas execution of David Lawson). Lawson's challenge to lethal gas execution as an unconstitutional punishment was dismissed as an abuse of the writ by a magistrate judge, a decision that was affirmed by the Fourth Circuit. See Lawson v. Dixon, 25 F.3d 1040, 1994 WL 258586 (4th Cir. 1994) (unpublished). The Supreme Court denied Lawson's application for a stay of execution and his writ of certiorari, with Justice Blackmun dissenting. See Lawson v. Dixon, ___ U.S. ___, 114 S. Ct. 2700 (1994).

chamber is that lethal injection is considered more humane than lethal gas as a method of execution. See, e.g., Ex. 92 (California Dept. of Corrections materials); Ex. 103 (California legislative material); 3 RT 165, 4 RT 44 (Zimring).²²

Other considerations appear much less relevant to the trend away from lethal gas. For instance, the attractiveness of lethal injection as a method cannot account entirely for the movement in gas states towards injection. If the attractiveness of lethal injection were the primary motivation for the change in methods, then those states using electrocution would be switching to lethal injection at a rate comparable to those using gas. 4 RT 24 (Zimring). Economic considerations also appear to have played very little, if any, part in the dramatic movement away from lethal gas. A number of states using lethal gas have added lethal injection as a method of execution, and two methods are likely more expensive than one. In addition, there is no evidence that any state that switched methods conducted any analysis of the costs of lethal injection. 4 RT 27 (Zimring). Nor can the flight from gas be adequately explained by safety concerns. Those same concerns would have been present in the 1930s-1960s; however, no dramatic shift

22. The hope to avoid legal challenges based on the cruelty of lethal gas also plays a role in the switch away from the gas chamber. Legal challenges themselves may reflect changing societal conceptions of a particular means of execution. 4 RT 33 (Zimring).

In addition, society's association of the gas chamber with the horrors of the Holocaust in Nazi Germany may help explain why this method of execution has fallen into disrepute. See RT 41-42 (Zimring); see also Ex. 104H (North Carolina legislative materials, statement of State Senator Robert M. Davis).

from gas is seen at the time. 4 RT 31-33 (Zimring). In addition, of the eight states other than California that had changed from lethal gas as the sole method at the time of trial, three still provide lethal gas as an option. This indicates that safety is not the primary factor influencing the move from lethal gas. 4 RT 32 (Zimring).

Arizona's recent shift towards lethal injection as a means of execution illustrates these trends. As of 1992, Arizona provided for execution by lethal gas. See Ariz. Rev. Stat. Ann., Ariz. Const. Art. 22 § 22 (1992). On April 6, 1992, Arizona executed Donald Harding, the first such execution in twenty-nine years. Ex. 56 (media accounts of Harding execution). The execution was, by all accounts, prolonged and apparently agonizing. See id. Spurred by the experience of this execution and the public's reaction to it, the Arizona state legislature passed a bill soon thereafter to shift towards use of lethal injection, with lethal gas retained as an option for those inmates sentenced before the legislative amendment. See Ariz. Rev. Stat. Ann., Ariz. Const. Art 22 § 22 (Supp. 1993); see also Ex. 56 (Abraham Kwok et al., The Arizona Republic, April 7, 1992, A1, "Harding's Death Raises Questions On Gas Chamber"); id. (Randy Kull & Pat Flannery, The Phoenix Gazette, April 7, 1992, p. A1, "Harding's Slow Death Renews Penalty Debate"); Ex. 104A (Decl. of Ruben F. Ortega, member Arizona state legislature) (stating he supports the death penalty but does not believe lethal gas is humane and therefore supports Arizona's shift to lethal injection).

Similarly, in the 1980s, defendants in this action researched lethal injection as an alternative to the San Quentin gas chamber. Ex. 92A-N. As a result of this investigation, defendants concluded, inter alia, that lethal injection "is generally viewed as the current 'state-of-the-art' execution technique"; and "is considered to be more humane than other methods of

execution," including lethal gas. See Ex. 92M at 4-5 (Department of Corrections Issue Memo: Possible Relocation of Condemned Row/Gas Chamber and Alternative Method of Execution). California's legislative history demonstrates that such concerns were also prime motivators for the state's legislators. See Ex. 103 (California legislative material).

CONCLUSION OF LAW

I. Standing

Defendant originally challenged plaintiff's standing to bring this action, on the grounds that under California Penal Code section 3604 a condemned inmate can choose to be executed by lethal injection.

On February 8, 1994, the Ninth Circuit issued its en banc opinion in Campbell v. Wood, 18 F.3d 662 (9th Cir.) (en banc), reh'g and reh'g en banc denied, 20 F.3d 1050 (1994). That case involved, inter alia, petitioner Campbell's challenge to the constitutionality of the State of Washington's method of execution by hanging. See id. at 680. As in California, the Washington statute permits condemned inmates to choose the method by which they will be executed; in Washington, the choice is between hanging and lethal injection. See Wash. Rev. Code § 10.95.180(1). Washington law provides that if the condemned inmate does not choose, then the execution will be carried out by hanging. Id.

Defendants in Campbell argued that Campbell's challenge to hanging was non-justiciable because he could elect to be executed by lethal injection instead. Campbell, 18 F.3d at 680. The original panel agreed with this conclusion. See Campbell v. Blodgett, 978 F.2d 1502, 1518 (9th Cir. 1992). The en banc panel squarely rejected this argument, however, holding that because Campbell had not chosen to be executed by

lethal injection, and consistently had maintained that he would not do so, he would be put to death by hanging. Therefore, reasoned the court, the controversy between the parties was sufficiently definite as to be justiciable. Campbell, 18 F.3d at 680-81.²²

In light of this recent binding precedent, defendants in this action have withdrawn their standing argument. The court agrees that plaintiffs here have standing to challenge the constitutionality of California's method of execution by lethal gas. See In re Christian Life Center, 821 F.2d 1370, 1373 (9th Cir. 1987) (where parties fail to discuss jurisdiction the court must raise issue sua sponte). As with the petitioner in Campbell, plaintiffs here have refused to elect a method of execution; thus, under California law, their executions, if carried out, will be by the administration of lethal gas. Their challenge to this method of execution is therefore justiciable.

II. The Merits

A. General Concepts

The eighth amendment to the United States Constitution, applicable to the states through the Fourteenth Amendment, Robinson v. California, 370 U.S. 660 (1962), prohibits "cruel and unusual punishments." U.S. Const. amend. VIII. The Amendment "embodies 'broad and idealistic concepts of dignity, civilized standards, humanity and decency'"

23. The court was apparently unanimous on this point. See id. at 692-93, 693 n.2 (Reinhardt, Browning, Tang, D.W. Nelson, JJ., concurring and dissenting); see also id. at 729 (Poole, , dissenting) (not specifically addressing the standing issue but reaching the merits of the case).

against which forms of punishment must be measured. Estelle v. Gamble, 429 U.S. 97, 102 (1976) (quoting Jackson v. Bishop, 404 F.2d 571, 579 (8th Cir. 1968)). It "expresses the revulsion of civilized man against barbarous acts -- they 'cry of horror' against man's inhumanity to his fellow man." Robinson v. California, 370 U.S. 660, 676 (1962) (Douglas, J., concurring).

The eighth amendment's restrictions on the ability of a state to impose punishment "aim . . . to protect the condemned from fear and pain . . . or to protect the dignity of society itself from the barbarity of exacting mindless vengeance." Ford v. Wainwright, 477 U.S. 399, 410 (1986) (plurality opinion). Fundamentally, the amendment stands to safeguard "nothing less than the dignity of man." Trop v. Dulles, 356 U.S. 86, 100 (1958).

The amendment has traditionally been interpreted to proscribe torturous punishments, such as disembowelment, drawing and quartering public dissection, and burning alive. Wilkerson v. Utah, 99 U.S. 130, 136 (1878). However, the amendment is not tethered to modes of punishment that were thought to be cruel and unusual at the time the Bill of Right was adopted. See, e.g., Weems v. United States, 217 U.S. 349, 373 (1910) ("a principle, to be vital, must be capable of wider application than the mischief which gave it birth"). Instead, the reach of the amendment has long been interpreted in a "flexible and dynamic manner." Gregg v. Georgia, 428 U.S. 153, 171 (1976) (joint opinion of Stewart, Powell & Stevens, JJ); see also Trop, 356 U.S. at 100-01 (scope of the amendment is "not static"). The eighth amendment "must draw its meaning from the evolving standards of decency that mark the progress of a maturing society." Trop, 356 U.S. at 101. As the concepts of dignity and civility evolve, so too do the limits of what is considered cruel and unusual.

B. Campbell v. Wood

The Supreme Court has rarely addressed the question of whether a specific mode of execution violates the eighth amendment. See Campbell, 18 F.3d at 681 (citing cases).²⁴ The Ninth Circuit, however, recently addressed this issue at some length in Campbell, a challenge to the State of Washington's method of execution by hanging. It is difficult at times to decipher the Campbell opinion. This court nonetheless must attempt to do so, since the issue in the instant case is directly analogous to the relevant issue in Campbell. The court will therefore review the Campbell opinion in some detail.

24. In Wilkerson, the Supreme Court upheld shooting as a means of execution. 99 U.S. at 134-35. In In re Kemmler, 136 U.S. 436, 10 S. Ct. 903 (1890), the Supreme Court upheld the use of electrocution as a means of execution, primarily on the ground that the eighth amendment of the time was not applicable to the states. Id. at 447. In dicta, the Court suggested that the method would not violate the amendment at any rate. Id. at 446-47. In Louisiana ex rel. Francis v. Resweber, 329 U.S. 459 (1947), the Court held that it was not cruel and unusual to subject an inmate to a second attempt at electrocution after the first attempt failed. In one of these cases did the Court analyze the issue at length nor set forth a framework of making such determinations.

There are also few detailed lower court cases addressing the constitutionality of a particular mode of execution. See Glass v. Louisiana, 471, U.S. 1080, 1081 n.3 (1985) (Brennan & Marshall, JJ., dissenting from denial of certiorari) (listing cases); In re Petition of Donald Thomas, 155 FRD 124 (D. Md. 1994) (granting request of condemned Maryland inmate to videotape the lethal gas execution of another inmate).

The Campbell court began by noting that recent eight amendment decisions have focused initially on whether the challenged punishment was considered unacceptable at the time of the adoption of the Bill of Rights. Campbell, 18 F.3d at 681. An affirmative answer would end the eighth amendment inquiry. See Ford v. Wainwright, 477 U.S. 399, 405-406 (1986). Because it was undisputed that hanging was considered a lawful method of execution at the time of the Bill of Rights, the Campbell court moved quickly to the second, "more difficult" question of how to determine whether a punishment that may have been acceptable to the Framers of the Constitution nonetheless now violates society's civilized standards. Campbell, 18 F.3d at 682.

Addressing this second question, the court explained that its mission was to "look to objective factors to the maximum extent possible." Id. (citing Stanford v. Kentucky, 492 U.S. 361, 369 (1989)). One of the objective factors to be considered is legislation passed by elected representatives. Id. Although the Campbell court specifically noted this factor, it was not swayed by the evidence before it that there was a trend "among several states" to move from execution by hanging to execution by lethal injection. Id.

Campbell had apparently relied on such cases as Coker v. Georgia, 433 U.S. 584 (1977), and Enmund v. Florida, 458 U.S. 782 (1982), for the proposition that "when the number of states exacting a given punishment dwindles, the punishment drops beneath the constitutional floor." Campbell, 18 F.3d at 682. In Coker, the Supreme Court held that the death penalty was a disproportionate punishment for the crime of rape, relying heavily on the fact that few states authorized capital punishment for rape. Coker, 433 U.S. at 593-96. Similarly, in Enmund, the Court found unconstitutional the sentence of death for a defendant who aids and abets a felony during which a murder is

committed by co-felons. Enmund, 458 U.S. at 801. Again, the Court focused on the fact that few states allowed for such a sentence. Id. at 792.

The Campbell court held that there is a "critical" distinction between cases such as Enmund and Coker, which challenge the proportionality of a given sentence, and cases such as Campbell's, which contest a particular method of execution. Campbell, 18 F.3d at 682. The court held that "methodology" cases, such as the one before it, must "focus[] more heavily on objective evidence of the pain involved in the challenged method." Id. The court then rejected Campbell's evidence of legislative trends as unhelpful and turned to an analysis of the pain inflicted by Washington's method of execution.

In discussing the pain suffered by an inmate executed by hanging, the Campbell court repeatedly focused on how long the inmate remained conscious during the execution, ultimately finding that Washington's method of hanging "results in rapid unconsciousness and death." Id. at 684. The one execution carried out according to the challenged protocol, the execution of Westley Allan Dodd, supported this finding. The attending physician noted that:

[w]hen Mr. Dodd's body dropped through the trap door there simply was no significant activity, there was no twisting, turning, no swinging. I carefully observed his chest and abdomen and I believe that there was one minimal effort at inspiration, breathing in, and following that, within several seconds, there may have been a small second inspiratory action.

Id. at 685. The Campbell court concluded that the district court had not erred in its finding that

"unconsciousness and death in judicial hanging occur extremely rapidly, that unconsciousness [is] likely to be immediate or within a matter of seconds, and that death [follows] rapidly thereafter." Id. at 687. The court also found that the risk of a more prolonged or painful death, such as by asphyxiation or decapitation, was "negligible." Id. Hanging under Washington's protocol, the court concluded, does not involve "lingering death, mutilation, or the unnecessary and wanton infliction of pain." Id. at 687. For these reasons, the court, the court upheld the district court's conclusion that Washington's method of putting inmates to death is constitutional.

The Campbell opinion thus made certain points clear. First, the key question to be answer in a challenge to a method of execution²⁵ is how much pain the inmate suffers.²⁶ Answering the question on

25. Since it is the method of execution that is challenged, it follows that a court must focus on the procedure as a whole and over time, rather than on any one particular execution. This common sense conclusion finds support in case law. For instance, the Resweber Court refused to deem it cruel and unusual when an "unforeseeable accident" rendered the first attempt at electrocution unsuccessful. Resweber, 329 U.S. at 464; see also Campbell, 18 F.3d at 687.

26. Campbell also explicitly held that, in determining whether a method of punishment is unnecessarily cruel, "[t]he relative merits of lethal injection are irrelevant to this question." Campbell, 18 F.3d at 687. It is not entirely clear to the court how it is to determine whether pain is "unnecessary" without some comparison or reference to other methods of execution. Presumably it is not the case that any method of execution, no matter how inherently painful, is acceptable as long as it is performed as humanely as

the facts before it, the Campbell court suggested a range of punishments that might be constitutionally acceptable.²⁷ Death where unconsciousness is "likely to be immediate or within constitutional limits."²⁸ While the Campbell court did not pinpoint a threshold at which the time to unconsciousness and the corresponding pain would violate the Constitution, the court implied that the persistence of consciousness "for over a minute" or for "between a minute and a minute-and-a-half, but no longer than two minutes" might be outside constitutional boundaries. Id. at 684.

Campbell also made clear that a method of execution must be considered in terms of the risk of

possible, without any more pain than is "necessary" to carry out that mode of execution.

27. The court found that Washington's hanging protocol ensured that consciousness would last only for seconds, rather than minutes, as is possible with other methods of hanging. Presumably, if the longer duration of consciousness would also have been constitutionally permissible, the court would not have had to analyze on which end of the spectrum Washington fell.

Again, some measure of pain would have to accompany even an extended period of consciousness in order to render it unconstitutional.

28. Presumably there could be some instances in which a method of execution that produced even very rapid unconsciousness could be unconstitutional. For instance, extreme or torturous pain during those moments of consciousness could conceivably render a mode of execution unnecessarily cruel; some other surrounding circumstance might also evince the sort of wanton cruelty or utter lack of regard for the dignity of man that would render the process unconstitutional. See Campbell, 18 F.3d at 702, 706 (Reinhardt, J., dissenting).

pain. The Campbell court determined that under the Washington hanging protocol, the risk of a prolonged and agonizing death by asphyxiation or decapitation was "negligible." Id. at 687. By analyzing this factor, the court indicated that the degree of risk is relevant in evaluating whether a method of punishment is unconstitutionally cruel. By stating that Campbell "failed to establish that the risk of either [asphyxiation or decapitation] . . . is more than slight," id. at 687, the court implied that a greater risk could be unconstitutional. See also id. at 708-11 (Reinhardt, J., concurring in part and dissenting in part emphasizing that analysis of a particular method of execution must focus on the risk of pain).

While it is clear that Campbell's analysis of judicial hanging is based on the objective evidence of the actual pain and risk of pain incurred²⁹, the opinion is less clear in other respects. After finding hanging was acceptable when the Bill of Rights was adopted, the court postulates that "the more difficult question is whether hanging comports with contemporary standards of decency." Id. at 682.³⁰ In the next step of this analysis the court states "we look to objective factors to the maximum extent possible" to determine whether the method is cruel and unusual. Id. (emphasis added).

29. Whether or not the Campbell court was correct in this focus on pain, see Campbell, 18 F.3d at 693-4 & n. 4 (Reinhardt, J., dissenting), is not of course for this court to determine.

30. The assumption, which the court hopes is correct, is that society's standards are evolving rather than devolving. Therefore, the "evolving standards of decency" prong can expand the reach of the eighth amendment, but cannot contract it.

The first objective factor noted by the court is state statutes providing for the method of execution. Campbell, 18 f.3d at 682. However, the court merely announces that these statutes carry a presumption of constitutional validity, and consigns analysis of state legislative trends to "proportionality review" from "methodology review," which it rather equivocally describes as focusing "more heavily on objective evidence of pain." Id. (emphasis added).

Therefore, while the court begins its analysis with reference to contemporary standards of decency, the progression of the opinion does not elucidate what role contemporary standards properly play in evaluating a method of execution. Some role clearly remains. The Campbell court begins its analysis with an explicit reference to contemporary standards. If the court intended to abandon this line of inquiry, it could have said so; it did not.

Nor does the court explain what it means by looking to objective factors "to the maximum extent possible," which implies that other factors remain relevant. The court is equally oblique when it describes methodology review, in comparison to proportionality review, as focusing "more heavily on objective evidence of pain," id. (emphasis added), suggesting evidence of pain is not the exclusive evidence permissible under methodology review. Even while appearing to reject proportionality review, which attempts to evaluate evolving standards of decency, the court ends its analysis by stating that "[e] cannot conclude judicial hanging is incompatible with evolving standards of decency," id., albeit casting the question in terms of objective evidence of pain.

Thus, the foundations of Campbell's analysis remain shrouded in suggestion and ambiguity: evolving standards of decency still may be a part of the equation; factors other than objective ones may be considered; and, while objective evidence of pain is

critical to the inquiry, other factors may be taken into account, although they weigh less heavily in the evaluation. In the face of these ambiguities this court attempts to apply Campbell to the record here.

While it is not clear what role legislative trends properly play in the analysis of the constitutionality of a method of execution, this court does not read Campbell as a sub silentio overruling of well-established precedent in this area, see, e.g., Trop v. Dulles, 365 U.S. 86 (1958), or as an "[e]visceration of the Eight Amendment," as did the dissenters in Campbell. See Campbell, 18 F.3d at 693-94, 703-08 (Reinhardt, J, concurring in part and dissenting in part).

Campbell dictates that a court look first to objective evidence of pain. In the Campbell case, this was all that was necessary, for the court concluded that there was no evidence of pain, or, more precisely, that the evidence indicated that there was no pain. The court therefore concluded its analysis. because Campbell had not shown that hanging involved any pain, his evidence of legislative trends, standing alone, could not "dictate the result" he urged. Id. at 682. The court refused to rule a method of execution impermissibly cruel "simply because few states continue the practice." Id. (emphasis added). Presumably, had the Court arrived at an opposite and definitive conclusion -- that hanging caused agonizing and prolonged pain -- the Court would also have found it unnecessary to analyze legislative trends. In that case hanging would be unconstitutional even if practice by every state in the union.

However, this court does not read Campbell to forbid resort to objective analysis of legislative trends in cases where the quantum of pain is neither clearly within nor clearly beyond constitutional bounds. Perhaps the Campbell court intended to create such a result -- to definitively rule out any objective evidence

except evidence of pain in all "methodology" cases. The opinion is not explicit on this point, however; in fact, the ambiguities in the opinion suggest that the Campbell court did not intend to go so far.³¹

In sum, this court reads Campbell to set forth a framework for determining when a particular mode of execution is unconstitutional: objective evidence of pain must be the primary consideration, and evidence of legislative trends may also be considered where the evidence of pain is not dispositive.

C. The Framework Applied

Neither party argues that execution by lethal gas is one of those modes of punishment considered unacceptable at the time of the adoption of the Bill of Rights. Accordingly, the focus here, as in Campbell, must be on whether this means of execution is contrary to "evolving standards of human decency." Trop, 356 U.S. at 101.

As Campbell dictates, the first question must be whether the pain inflicted by lethal gas is so great as to render the method of execution unconstitutional, without consideration of additional factors.³² As set

31. As the Campbell dissenters pointed out, if the majority opinion were construed in that way, it would represent a radical departure from previous eight amendment jurisprudence.

32. The court notes that the record before this court regarding the question of pain and consciousness is extraordinarily detailed and comprehensive, as is the record regarding legislative trends, discussed supra. This contrasts with what was apparently a much more limited record before the district court in Campbell. See Campbell, 18 F.3d at 668. According to the defendants here, the Washington hearing lasted three days, and the

forth above in the Findings Of Fact, the objective evidence of pain and suffering upon administration of lethal gas demonstrates that death by this method is not instantaneous. Death is not "extremely rapid[]" or "within a matter of seconds." Campbell, 18 F.3d at 687. Rather, the court has determined that inmates are likely to be conscious for anywhere from fifteen seconds to one minute from the time that the gas strikes their face.³³

Nor is the risk of an even more prolonged period of unconsciousness "negligible." Id. To the contrary, there is a substantial risk that consciousness may persist for up to several minutes. An inmate who is "apparently unconscious" may in fact still remain conscious; or his consciousness may wax and wane until the point where he is pronounced "certainly unconscious." This risk of extended periods of consciousness is heightened by the unscientific, slapdash manner in which the San Quentin protocol was created. Warden Vasquez frankly acknowledged that he never consulted with medical personnel when he was charged with re-instituting the practice of lethal gas executions. 2 RT 85, 87, 89 (Vasquez). By contrast, the Campbell court found that Washington State's protocol for hangings was designed so that the risk of prolonged consciousness was minimized. No such efforts were undertaken here.

Moreover, this court determines that during this period of consciousness, the condemned inmate is

testimony of actual eyewitnesses to hanging was limited. See 7 RT 217-18.

33. The court notes that the Campbell court, like this court, considered the objective contemporaneous accounts of medical personnel to be most relevant to a determination of pain and consciousness. Campbell, 18 F.3d at 685.

likely to suffer intense physical pain. The primary cause of this pain is cellular suffocation, which is experienced by the inmate as an intense and visceral "air hunger" analogous to strangulation or drowning. Symptoms of air hunger include intense chest pains, such as felt during a heart attack, acute anxiety, and struggling to breath. Inmates executed in San Quentin's gas chamber may also experience secondary pain due to excessive amounts of lactic acid that builds up in the cells as they attempted to compensate for interference with their ability to convert oxygen to energy. Finally, some inmates executed by lethal gas may experience the exquisitely painful muscle spasms associated with tetany.

The type of suffering likely to be experienced by those executed at San Quentin is analogous to the type of pain that the Campbell court suggested would be impermissibly cruel. The court emphasized that the "drop distance" of Washington's protocol insured that death did not occur by asphyxiation. Campbell, 18 F.3d at 684. As detailed above, lethal gas causes cellular suffocation, a substantially similar experience to asphyxiation.³⁴

34. Defendants argue that even if inmates do experience "air hunger," such an effect is more akin to "discomfort" than to the type of pain forbidden by the eight amendment. The court emphatically rejects this argument. Just because suffocation may cause a more visceral or generalized type of pain than does, say, death by shooting, that does not mean that the former type of pain is constitutionally acceptable. To interpret the eight amendment as limited to acute, localized pain would be to flout the mandate that the amendment must be interpreted flexibly. See Gregg, 428 U.S. at 171; Trop, 356 U.S. at 100-01; see also Campbell, 18 F.3d at 684 (analyzing risk of death by asphyxiation).

While the objective evidence of pain and consciousness in California's gas chamber is clearly greater than that presented in Campbell, it does not rise to the extreme level where this court can conclude its analysis without examining the other objective factors that a long line of precedent, ending with Campbell, insist that this court must perform. Were the evidence to demonstrate conclusively that inmates executed at San Quentin experience the agonizing pain of cellular suffocation, acidosis, and tetany for minutes on end, the court would have no trouble finding the method of execution contrary to contemporary standards of decency. Conversely, were the evidence of pain to show that inmates suffer pain for only a matter of seconds, the court would be bound by Campbell and other precedent to find the administration of lethal gas constitutionally acceptable. This case falls somewhere in between. For that reason, the court turns now to other objective indicia that the punishment is contrary to society's civilized standards.

The evidence of legislative trends detailed above clearly indicates that execution by lethal gas no longer comports with the civilized standards of our society.³⁵

The court notes that the sort of diffuse suffering experience by suffocation is distinct from mere psychological distress. It is true that psychological distress alone may be insufficient to render a punishment unconstitutional, since some amount of fear of death is inevitable. See Cook v. Whiteside, 505 F.2d 32, 34 (5th Cir. 1974). However, the terror and agony that accompany suffocation and drowning are inextricably linked to the body's physical needs.

35. As the Campbell court noted, state legislatures are presumed to select constitutionally acceptable punishments. Campbell, 18 F.3d at 682. Nonetheless, "it

The Supreme Court has found punishments to be incompatible with society's contemporary values in instances far less stark than the instant one. For instance, in Enmund, the Court invalidated the death penalty for felony murder, emphasizing that only eight of thirty-six jurisdictions authorized a similar punishment. Enmund, 458 U.S. at 792. Similarly, the Court held that it was cruel and unusual punishment to impose a death sentence for the crime of rape, where only three states permitted such a sentence. Coker, 433 U.S. at 594; see also Solem v. Helm, 463 U.S. 277, 299-300 (1983) (holding that a life sentence without parole for a recidivist is cruel and unusual where "[i]t appears that [petitioner] was treated more severely

is evidence that legislative judgments alone cannot be determinative of Eighth Amendment standards since that Amendment was intended to safeguard individuals from the abuse of legislative power." Gregg, 428 U.S. at 174 n. 19 (joint opinion of Stewart, Powell & Stevens, JJ). The amendment would be rendered a nullity if courts were required to defer in all cases to legislative judgments.

Moreover, given the dynamic and flexible way in which the eighth amendment is interpreted, statutes enacted in previous decades do not necessarily carry the same presumptive weight of constitutionality when examined according to contemporary standards. Although the California legislature has not done away with executions by lethal gas, it is difficult to read California's death penalty statute, as it now stands, as a ringing endorsement of the means of execution. The recent statutory amendment shifting California towards lethal injection can easily be read as a movement away from the statute as it was originally enacted and away from the administration of lethal gas as an acceptable means of punishment.

that he would have been in any other state."); Ford, 477 U.S. at 408 (noting, in holding that the eight amendment bars the execution of the insane, that "no State in the Union" permitted such a punishment); Weems, 217 U.S. at 377 (noting the penalty of cadena temporal "has no fellow in America legislation"); Thompson v. Oklahoma, 487 U.S. 815 (1988) (plurality opinion) (invalidating death penalty for fifteen-year-olds, noting all eighteen states to consider minimum age for imposing death penalty require defendant to be sixteen years old).

Conversely, in cases in which the Court has rejected such eighth amendment challenges, the evidence that a particular punishment is societally unacceptable has been much more equivocal. See, e.g., Tison v. Arizona, 481 U.S. 137, 154 (1987) (noting, in holding that death penalty for major participation in a felony with reckless indifference to human life is not unconstitutional, that only eleven jurisdictions had rejected capital punishment for such crimes); Stanford, 492 U.S. at 370-71 (noting, where twenty-two of the thirty-seven jurisdictions authorizing capital punishment allow such punishment for sixteen year olds, that "[t]his does not establish the degree of national consensus this Court has previously thought sufficient to label a particular punishment cruel and unusual."); Penry v. Lynaugh, 492 U.S. 302, 334-35 (1989) (holding execution of mentally retarded persons is not unconstitutional, noting that only two states prohibit it).

The trends and statistics regarding the use of lethal gas indicate an abandonment of that means of execution that rises to the level of a national consensus. An analysis of the statistics and trends leads inexorably to the conclusion that the gas chamber has fallen into disrepute as a means of execution.

The objective statistics indicating that the gas chamber is no longer consistent with this society's

values are buttressed by evidence drawn from legislative histories. A review of the legislative histories of those states that have moved away from lethal gas executions demonstrates that the flight from gas is influence, at least in large part, by the belief that lethal gas is a cruel and inhumane way to put a person to death. Perhaps even more telling are the statistic regarding those states that have actually carried out a lethal gas execution. Those that had done so by the time of trial had uniformly moved away from using that method as a sole means of execution.

In short, our society no longer considers lethal gas an acceptable means by which to execute a person. There is a societal consensus that this method of execution is inhumane and has no place in civilized society.

CONCLUSION

The eight amendment must reflect the changing standards of decency in our society. Its reach is dynamic and evolving, as are society's conceptions of the dignity of the individual. While "it is for [the judiciary] ultimately to judge" whether a given punishment offends the eight amendment, Enmund, 458 U.S. at 797, the amendment is not a vehicle for judges to impose their own views about what society's standards ought to be. Therefore, an eighth amendment inquiry must be guided as much as possible by objective factors.

In a case such as this one, the primary objective evidence to be considered must be the evidence of the pain experienced by the condemned inmate; evidence of legislative trends vis a vis the challenged method is also relevant. The evidence presented concerning California's method of execution by administration of lethal gas strongly suggests that the pain experienced by those executed is unconstitutionally cruel and

unusual. This evidence, when coupled with the overwhelming evidence of societal rejection of this method of execution, is sufficient to render California's method of execution by lethal gas unconstitutional under the eight amendment.

Accordingly, the court hereby DECLARES that California Penal Code § 3504, to the extent that it requires or permits the imposition of death by administration of lethal gas, violates the eight and fourteenth amendments of the United States Constitution.

Defendants are hereby ENJOINED from administering lethal gas to inflict the punishment of death on any of the plaintiffs to this action.³⁶

IT IS SO ORDERED.

Dated: October 4, 1994

MARILYN HALL PATEL
United States District Judge

36. Because the court enjoins the use of lethal gas, it is unnecessary to address plaintiffs' request that defendants' be enjoined from using threat of execution by lethal gas to secure inmates' consent to execution by lethal injection.